Trans Australian Railway

Linking East & West

Opening Ceremony by

The Right Honorable Sir Ronald Craufurd Munro Ferguson P.C. G.C.M.G.

Governor-General of the Commonwealth of Australia

12th November 1917.

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This Souvenir

of the Opening of the
Trans-Australian Railway
is presented to Guests by
the Minister of State
for Works & Railways

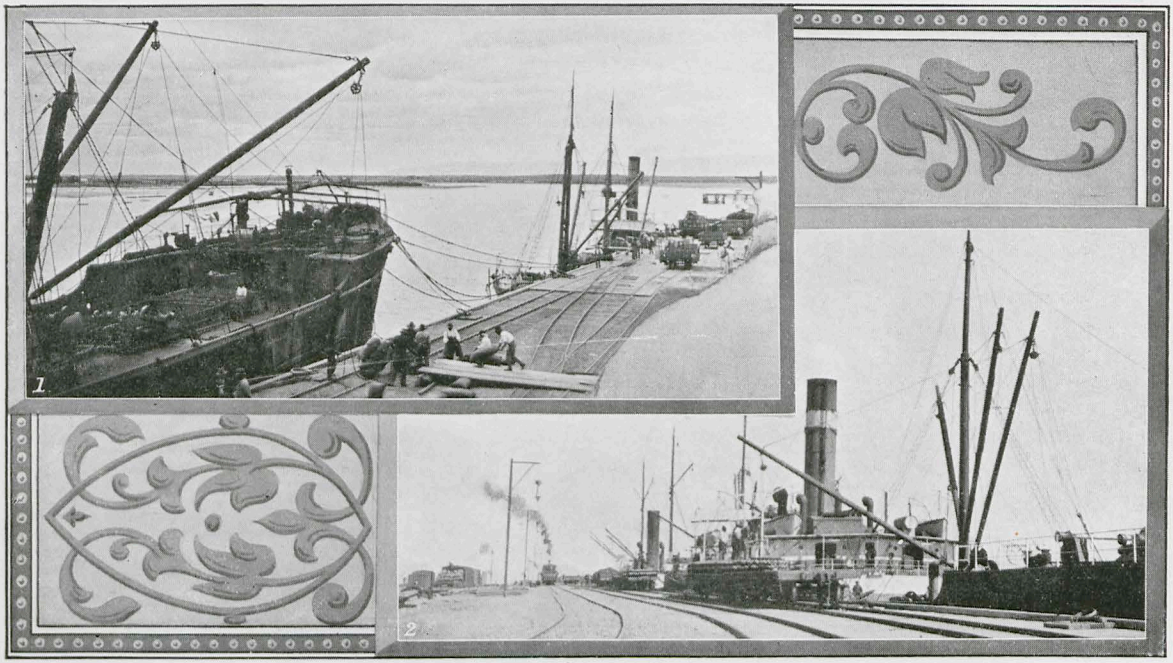
12/11/17

W. A. Watt

View of Fremantle Harbor, "The Gateway of the West."

Hannan Street, Kalgoorlie.

Commercial Road, Port Augusta.



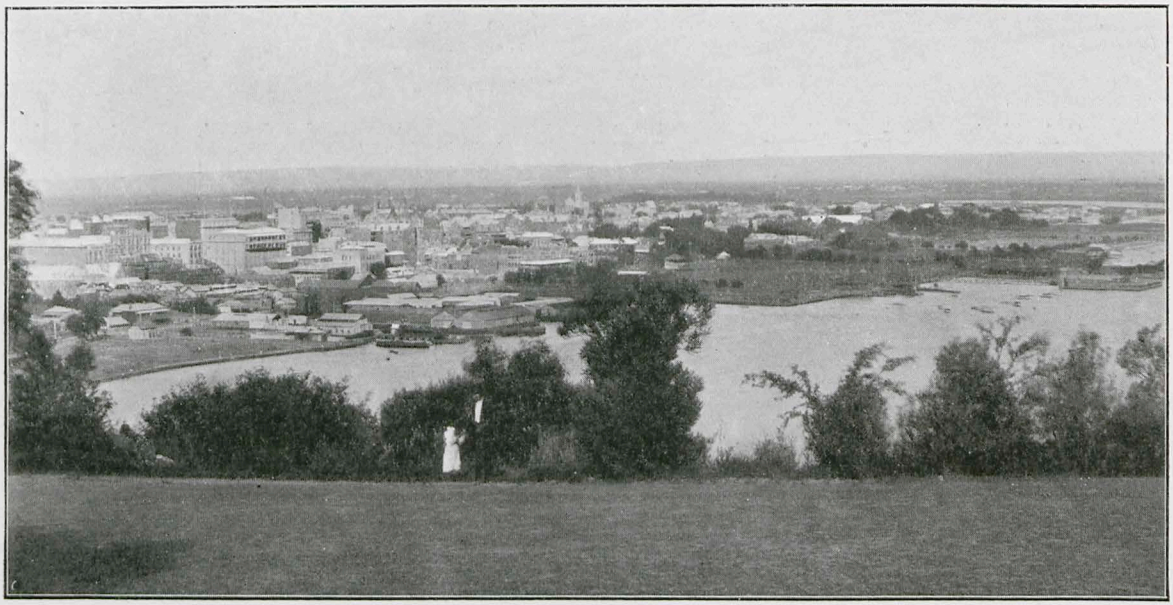
Port Augusta Wharf.

TRANS-AUSTRALIAN RAILWAY

Linking East and West

"A Nation for a Continent and a Continent for a Nation" was the fine phrase coined when Australia became a Commonwealth. But it is the completion of those twin threads of steel—the Kalgoorlie to Port Augusta Railway—which has made the phrase a reality. Until this bridge was thrown across the No Man's Land that stretches northward from the shores of the Great Australian Bight, Australia consisted in effect of two great islands—an eastern and a western. Long ages have passed since the sundering sea actually rolled between, but for nearly all practical purposes Western Australia was, until the other day, as completely separated from the Eastern States as New Zealand is. One link by land, and only one there was—the telegraph line that runs round the coast of the Bight; but to travel from the East to Western Australia, or from the West to the East, meant a sea journey of over a thousand miles. Even the Northern Territory was not so completely isolated from the rest of the Commonwealth as the great and growing State of Western Australia.

The opening of the Railway marks, therefore, the opening of a new era in the history of Australia. As the Canadian-Pacific Railway, flung across the empty spaces of the prairies, brought British Columbia into touch with Eastern Canada, so this great national highway of ours has drawn closer and welded our wide-spread interests and made Australia a Continent—one and indivisible—in a sense that has never been true before.



Perth, the Western Capital. "For nearly all practical purposes Western Australia was, until the other day, as completely separated from the Eastern States as New Zealand is."

FRAGMENTS OF HISTORY.

The idea of overland communication between the eastern and the western portions of Australia goes back almost to the foundation of South Australia. The first proposal of the kind was made 77 years ago, when that State was but four years old. On 3rd June, 1840, the Chairman of the Agricultural Society of Western Australia put before that body the particulars of a "plan put forward by the inhabitants of South Australia to open a road to this Colony." The idea met with fierce opposition, and was rejected on the ground of "impracticability, and the undesirability of making a road to enable bushrangers . . . . . to make raids upon this Colony."

In spite of this rebuff, the South Australians were determined to see what lay between them and their western neighbours. In the following year Edward John Eyre made the first overland journey from South Australia, leaving Fowler's Bay on 25th February, and reaching Albany on 7th July. The perils and heroic struggles of this first overlander in his four months' journey along the inhospitable shores of the Bight are part of our history, but one link between Eyre and the Great Federal Railway may be noted here. Before he set out for Albany, Eyre was exploring the country to the north of Spencer Gulf. His base for this work was at Depot Creek, a stream on the western side of the Flinders Range, 25 miles from Port Augusta, and it is from Depot Creek that the water for the eastern end of the railway is now drawn.

In 1870 another traveller, much more directly connected with the line, travelled round the coast of the Great Australian Bight, the journey being from West to East this time. This was Sir John Forrest, who reached Port Augusta after five months' hard travelling, including an exploration of much of the country near the route of the railway. Forty-two years later, in 1912, Sir John paid a second visit to

Port Augusta to be present at the turning of the first sod of the railway which he had long and earnestly advocated. To-day he has lived to see, as Treasurer of the Commonwealth, the opening of the line.

In the seventies, too, Ernest Giles, while journeying overland from South Australia to Western Australia, crossed a portion of that great plain without a tree or a bush more than a few feet high, across which the line now runs for hundreds of miles. To this has been given the name of the Nullarbor Plain, which sounds aboriginal, but is really the Latin *nullus arbor*, "no tree."

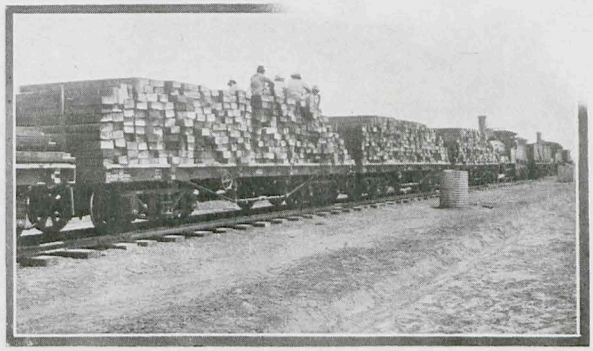
As early as 1878, when the South Australian Railways were extended to Port Augusta, there were not lacking advocates of a proposal for a line from Port Augusta to the west. Later a proposal made in the South Australian Parliament to run a line from Port Augusta to a point more than 100 miles to the north-west was lost by but a single vote. Had this line been built, it would have followed roughly the route of the first section of the Commonwealth Railway, which keeps away to the north in order to round the northern end of Lake Gairdiner.

But it was the marvellous growth in the population, wealth, and importance of Western Australia, beginning with the great gold discoveries in the early nineties, which first brought the idea of a railway to link up the two sides of the Continent within the range of possibility. The lure of gold caused flourishing cities to spring up in the hinterland of Western Australia, and drew railways further and further inland till they reached Kalgoorlie, nearly 400 miles east of Perth, and so reduced the distance to be bridged to less than 1,100 miles. Then, in 1901, came the Federation of Australia, implying a closer relationship between the scattered towns and settlements of the vast territory included in the bond.

In 1901, too, a rough survey was made of the western part of the country which the railway, if constructed, would traverse; but little progress was made for several years after this. Early in 1908, however, the Federal Parliament voted £20,000 for a survey of the proposed line, thus marking its definite participation in the scheme.

The proposal to construct the railway was introduced in the Federal Parliament on 20th September, 1911, and the Kalgoorlie to Port Augusta Railway Act received the assent of the Governor-General on 12th December, 1911.

The "first sod" of the line was turned by the then Governor-General, Lord Denman, at Port Augusta, on 14th September, 1912.



"Sleepers of best Australian Timbers."

THE RAILWAY.

In mere length the line far exceeds anything of the kind previously undertaken in Australia. It is practically twice as long as all the railways of the State of Tasmania put together, and nearly half as long as all the railways of South Australia. The gauge is the world's standard, viz., 4' 8½".

The rails used are 80 lbs. to the yard, and altogether approximately 140,000 tons were needed.

Sleepers of best Australian timbers, and to the number of about 2,500,000, support the rails, while the ballast, consisting of broken stone and gravel, represents nearly 2,000,000 tons.

The ruling gradient is 1 in 80, and there are long stretches in which the earth work was very light ; nevertheless the construction of the railway has involved the removal of about 5,000,000 cubic yards of earth and rock. In one 25-mile stretch through sandhill country 1,000,000 cubic yards were shifted. Some of the cuttings through the sandhills have had to be faced with stone to prevent the sand from drifting.

In crossing the Nullarbor Plain the railway runs without a curve for 330 miles, which is probably easily the world's record for a "straight."

The station and workshop equipment of the line is of a simple kind, the policy throughout being to do with as little as possible for the present, while leaving room to make provision for the greater requirements of the future. The main equipment is at Port Augusta end, where a two-story concrete building will serve for the necessities of the station and as offices for the administrative staff located there. Here also are the locomotive workshops and carriage sheds at which the major portion of the repair work will be carried out. Eventually the Commonwealth will probably build all its own rolling-stock at Port Augusta. Even now, with the limited facilities available, good work in the way of carriage building is being done there, and some of the locomotives on construction work have been practically re-built.

THE PROBLEM OF CONSTRUCTION.

The difficulties in the way of construction were unique. In all its length of about 1052 miles there are no permanent streams, and such supplies of water as were known to be available were wholly inadequate in quantity and mainly unsuitable. On a stretch of 840 miles there was

only one known source of supply. For nearly 800 miles also the country was without a trace of settlement. In fact, no similar length of railway has ever in the world's history been built through country so absolutely lacking in natural aids. On the Port Augusta end there was a certain amount of pastoral settlement extending as far as the small gold-mining township of Tarcoola, 260 miles out. Even in this section the settlement was almost negligible. Land is reckoned in square miles, not in acres, and homesteads were very few and far apart. But when the survey crossed the western boundary-fence of the Wilgena Station, a few miles west of Tarcoola, it plunged into the void. From this fence to a point a few miles out of Kalgoorlie the route ran through an empty land in which no white man lived or had lived since the beginning of time. Its only human inhabitants were a few aborigines, miserable savages of a low type. The nearest settlement to the route was the little telegraph line station at Eucla, 70 miles to the southward of a point just west of the Inter-State border. This and one or two other settlements still further away and clinging to the inhospitable shores of the Bight were the only breaks in the solitude that lay southward from the route to the ocean. Northward the Continent stretched away vacant and desolate league after league to the shores of the far-off tropic seas.

Such was the country which faced the builders when the work began. For the wants of the army of 3,000 men or so and hundreds of animals needed for construction, the country yielded nothing for three-fourths of the way and more but a certain amount of feed for the animals, and firewood. Even the firewood failed on the great plains through which the line runs for 450 miles.

But from Kalgoorlie, the magic city which has sprung up in the "desert" like an exhalation from the treasures of the Golden Mile, the railway has been drawn eastward towards the rising sun over the granite tablelands of one of the oldest land surfaces of the globe, where "league after league the formless scrub took shape and flitted by." Then for 450 miles it runs with scarcely a curve across

The "Golden Mile," Kalgoorlie.

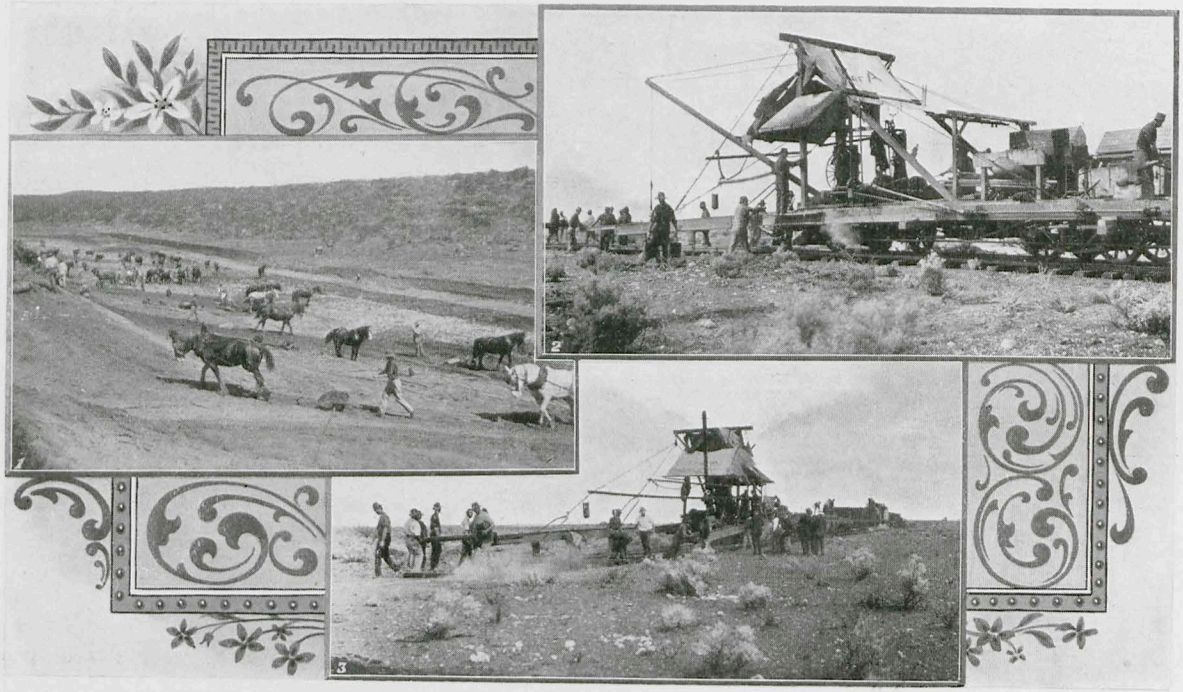
one of the greatest open plains, an old sea-bed long since upheaved, where hour after hour the circle of an horizon unbroken by hill or tree moves onward with the train. From Port Augusta, at the head of Spencer Gulf, the doorway to that inner Australia which seems so incredibly remote to the dwellers in the coastal strips, the rails have been pushed westward past great lakes, seas of shallow water in the winter and vast sheets of white salt glistening in the sun in the summer; and then across red-soil plains broken here and there by hills and rock outcrops of weird and rugged shapes, like the remnants of an older world. They have been driven through a belt of sandhills stretched north and south across their path, rising and falling like the waves of a tumbled sea suddenly frozen. And just beyond, on the edge of the plains which roll away apparently to infinity—while far away to the north the hills in the direction of the Musgrave Ranges rise dim and blue, like the mountains of a dream, on the distant horizon—the ends met and the last spike was driven.

METHODS OF CONSTRUCTION.

The work of construction was begun at each end and pushed through to a meeting point. Supervising engineers and other controlling officials were appointed at each end, and the whole work, from April, 1914, has been controlled by the Engineer-in-Chief, Mr. Norris G. Bell, M.Inst.C.E.

Whilst there were no mountains to cross or fast-flowing rivers to bridge, difficulties were encountered of a type hitherto unknown in Australia—probably hitherto unknown in the annals of railway building.

"METHODS OF CONSTRUCTION."



(1) Scoop Gang. (2) and (3) Tracklayer at work.

With over 1,000 miles of track, hand platelaying had to give way. At each end a Roberts "tracklayer" was installed. It is a mechanical roadlayer, effectively lightening labour and ensuring rapid tracklaying. At one end alone, day after day a mile of track was laid. At one end for some time a mile and a half was laid daily. At the western end in one period of 48 weeks the tracklayer covered 249 miles. In another period of 22 weeks 115 miles were laid—5¼ miles per week, easily the record rail-laying for Australia.

Steam shovels were extensively used in the cuttings and in the ballast pits. Their use reduced costs and enabled the work to be pushed on. Scoops and side tip-trucks, with light lines of rails leading from cuttings, were also extensively used. They were a great success. Motor tractors were used for ploughing. Motor cars were also extensively used for facilitating the movements of the supervisors. Hundreds of camels found a place on the works.

The advance engineering staff were accommodated in a camp train, consisting of office car, store car, hospital car, &c. As the rails reached out, so this train advanced, and the supervisors were always on the scene of operations.

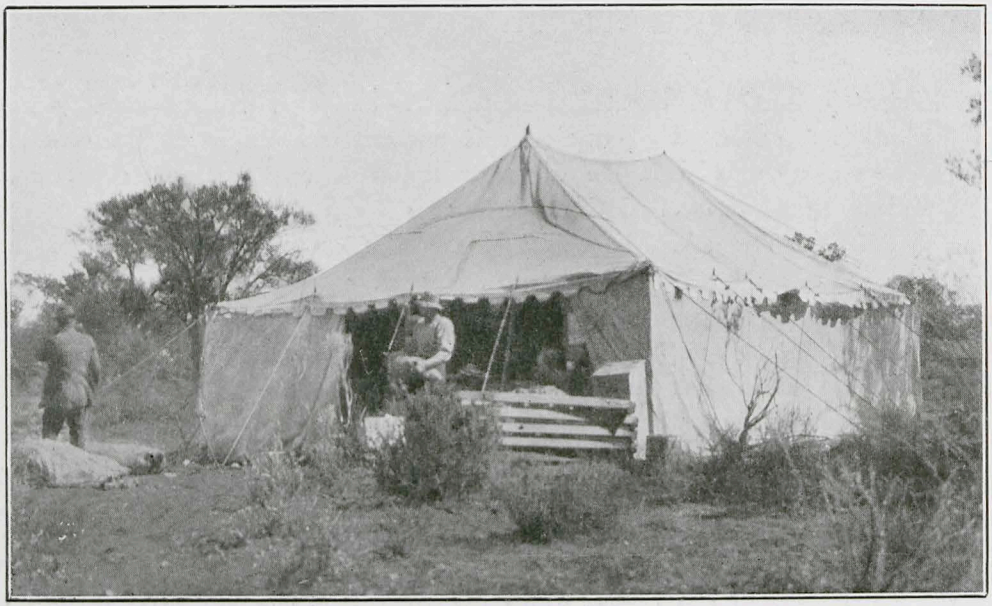
Owing to shortage of water and consequent difficulties in transport, earthworks, &c., could only be carried on immediately in advance of the rail head.

The bases were Kalgoorlie at the western end and Port Augusta at the eastern. Kalgoorlie had a population of 30,000 to draw upon for labor and a water supply available. Lying 387 miles inland, it is connected with the port of Fremantle by a 3' 6" gauge line. All material and supplies had to be conveyed over this narrow gauge line from the seaboard or other parts of the State at heavy expense for transport.

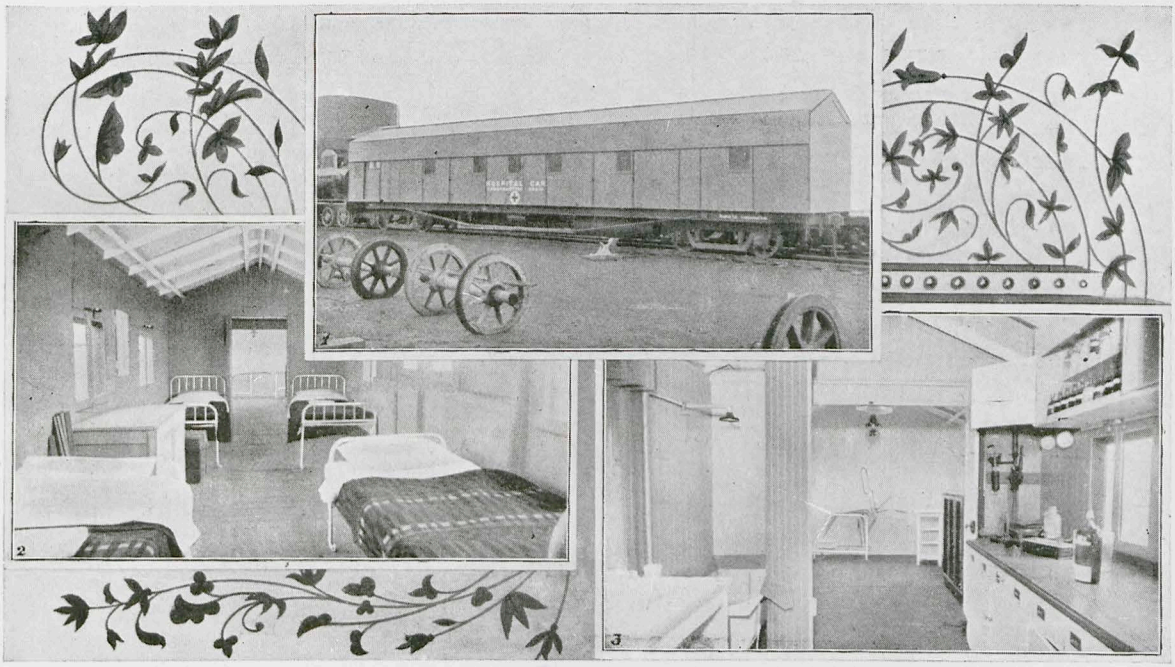
(1) Camel Team with Well Timbers. (2) "Coming Home." (3) Scooping.

Port Augusta, on the other hand, is one of the best ports in South Australia. There is 22 feet of water alongside the wharf at low tide and a rise of 12 feet in spring tides, so that supplies and material could be landed there right at the base.

The building of the railway presented problems not to be found, at any rate to the same extent, in any other railway in Australia. The organization of transport and supplies for the thousands of men and hundreds of animals employed in the wilderness traversed, the water supply question, and the necessity for undertaking all sorts of subsidiary enterprises which normally form no part of railway construction, all added to the task. To meet these special conditions the Commonwealth Railway Department had to become a wholesale and retail storekeeper, a boarding-house keeper, an owner and breeder of camels, a dealer in horses, a hospital board, a branch of the post office and savings bank, and many other things. The stores, fixed and on wheels, on the eastern section catered for about 2,000 people scattered along 400 miles of line. They carried a stock worth nearly £20,000, and supplied anything and everything, groceries, draperies, boots, medicine, hardware, silk shirts, even brilliantine for the hair. The store on wheels, familiarly called the "tea and sugar train," carried not only a travelling pay office and a general store, but baker's, butcher's, and greengrocer's shops. The men could buy good food at reasonable prices and cook it themselves, or they could get board at a "ranch" run by the Commonwealth. Every provision was made for accidents or sickness amongst the workers. On each end of the line was a well-equipped hospital car, with a qualified chemist and dispenser. Medical attendance was also available. For these special services the workers on the line paid 6d. each per week. Their chief complaint was that the country was so healthy that they never got their money's worth.



Departmental Provision Store at Head of Road.



(1) Hospital Car with Main Camps at Head of Road. (2) Ward in Hospital Car. (3) Dispensary.

Nor was the mind neglected in the scheme. At the larger and more permanent depots and quarries where a large number of men with families were working, schools were established for the children, the States supplying teachers. There were several hundreds of children along the line.

The main camps were, of course, at the head of the road on each section. From these camps the rails were pushed forward from day to day, and at frequent intervals the camp itself was moved forward, keeping the gangs as close as possible to their work.

"At frequent intervals the Camp itself was moved forward."

On top of the natural obstacles to the work came troubles caused by quite outside causes, such as drought, war, and strikes. The drought which culminated in 1914 is said to have been the severest ever known in that region. War conditions cut off absolutely or seriously delayed supplies from overseas, and strikes of workmen were unfortunately not infrequent. Still the work progressed.

THE REGION TRAVERSED.

The country through which the railway runs falls naturally into four divisions :—

1. The granitic plateau extending for 167 miles eastward from Kalgoorlie.
2. The limestone "plain" which runs for 450 miles to the east from the edge of the granitic country.
3. The belt of sandhills on the eastern edge of the limestone region through which the line runs for about 50 miles.
4. The stretch of country extending for nearly 400 miles from the eastern edge of the sandhills to Port Augusta.

Homestead 30 miles from Kalgoorlie.

Erayinia Rocks, 75 miles from Kalgoorlie. Wild-flowers.

"THE REGION TRAVERSED."

Spinifex and Mallee, 135 miles from Kalgoorlie.

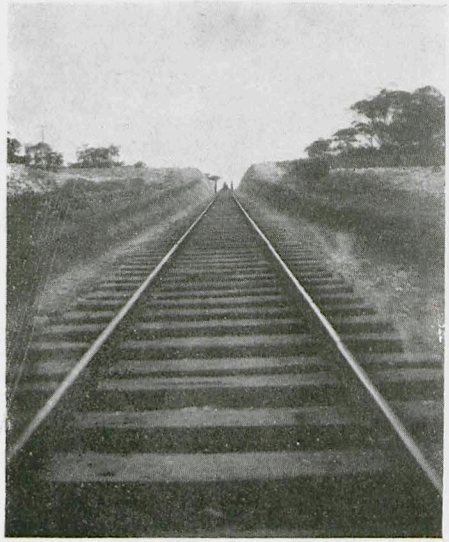
Of these, the westernmost division resembles the goldfields country of Western Australia, the easternmost is of the same type as the neighbouring parts of South Australia; but the limestone plains and the sandhill country near Ooldea are not quite like anything else in Australia, or indeed on this earth.

Creek, 144 miles from Kalgoorlie, after storm.

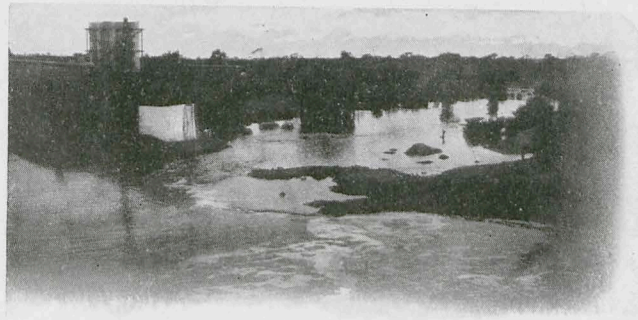
Wells at Wirraminna, 158 miles from Port Augusta.

"THE REGION TRAVERSED."

From Kalgoorlie the line runs across a plateau dipping very slowly towards the east on the whole, but swelling at intervals into irregular ridges and broken by outcrops of granite which form low rounded hills. At a place 101 miles east of Kalgoorlie, there is a shallow cutting through the summit of one of these ridges, and this is the highest point on the line—1,326 feet above sea level. At Goddard's Creek, 45 miles further on, the level falls to 900 feet.



The Highest Point on the Line. 101 miles East of Kalgoorlie.



Goddard's Creek, showing Condensers.

"THE REGION TRAVERSED."

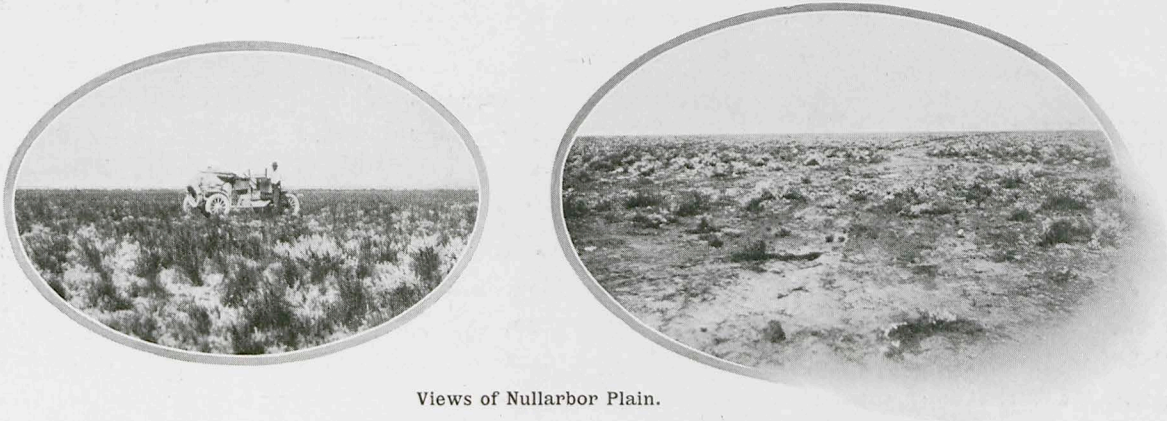
This first section of the line runs through timbered country nearly all the way. Much of it is covered fairly thickly with salmon-gums and other eucalypts of fair size, running up to 50 or 60 feet in height. In parts the kurrajong and the odoriferous sandalwood, the true sandalwood of commerce, are

"Tarcoola Blocks," Tarcoola.

Survey Camp near Port Augusta.

fairly abundant. In fact, many hundreds of tons of sandalwood have already been cut and sent down the line to find its way to the East and lend its heavy fragrance to Chinese joss-houses. Here and there grow clumps of that strange eucalypt, the gimletwood, its grain twisted like the tool from which

it takes its name. For mile after mile the countryside gleams white with everlasting daisies, and, in the spring, the native hop, with its rich reddish-brown masses of flowers, stands out in strong contrast to the sombre green of the trees and shrubs.



Views of Nullarbor Plain.

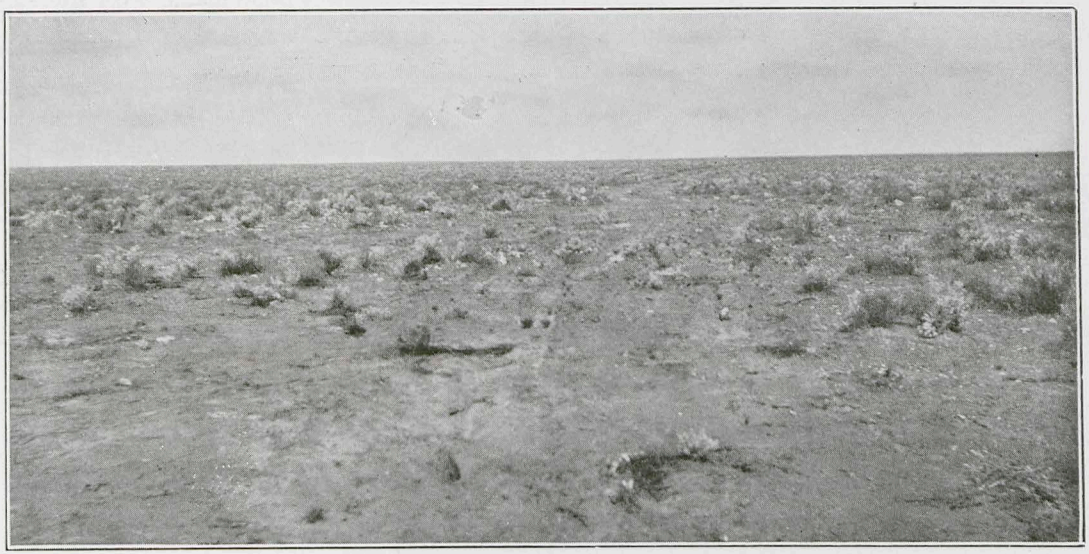
The granite dips beneath the limestone 167 miles from Kalgoorlie, and here you pass abruptly into another world. The outward and visible sign of the change is the vanishing of the eucalypts. So sudden and complete is their passing that a line could be drawn north and south across the country to the west of which the gums dominate the scenery, while to the east there are none. From this onward you see not a single eucalypt, great or small, till the mallee gums of the Ooldea sandhills, 450 miles to the east, are reached. A trip along this line can be confidently recommended to

those critics who complain of the "eternal gum-tree" in Australian landscapes. Nowhere, except in the western division, is the gum-tree the dominant tree of the countryside. On this second division, the largest of all, it is completely absent, while in the east it plays quite a secondary part as compared with the myall, the mulga and other acacias, and the black oak.

But though the limestone appears 167 miles out, there is still 40 miles to go before the open plain is reached. Here grow the black oak with its dark rugged stem and the hair-like foliage which marks all the casuarina family, the myall and the mulga with their dull green leaves. Below are the saltbush and the bluebush, the characteristic plants of all this country. The bluebush is particularly conspicuous with its leaves of a bluish-white, a shade which no other plant can quite rival.

As the line approaches the 200 mile mark the trees grow more and more scattered, and the bluebush and the saltbush spread. Naretha, at the 205 mile post, lies just to the east of a ridge with a fair growth of black oak, myall, and mulga, and, from this point onward, the line runs over the Nullarbor Plain. Except for a narrow belt, a couple of miles wide, of black oak and myall, which crosses the line, running north and south, 286 miles out, there is not a tree, and only at long intervals a bush, more than 3 or 4 feet high, visible.

Once past this belt, and you are on the true Nullarbor Plain. It is not a dead level, but rolls away mile after mile, league after league, in very gentle undulations. It dips slowly, very slowly indeed, much less than a foot in a mile on the average, towards the east. A foot or so of red soil covers the limestone, but, on all the rises, fragments of broken limestone project upwards through the soil or lie loose upon the surface. Here and there are dongas, or slight depressions in the surface, in which a

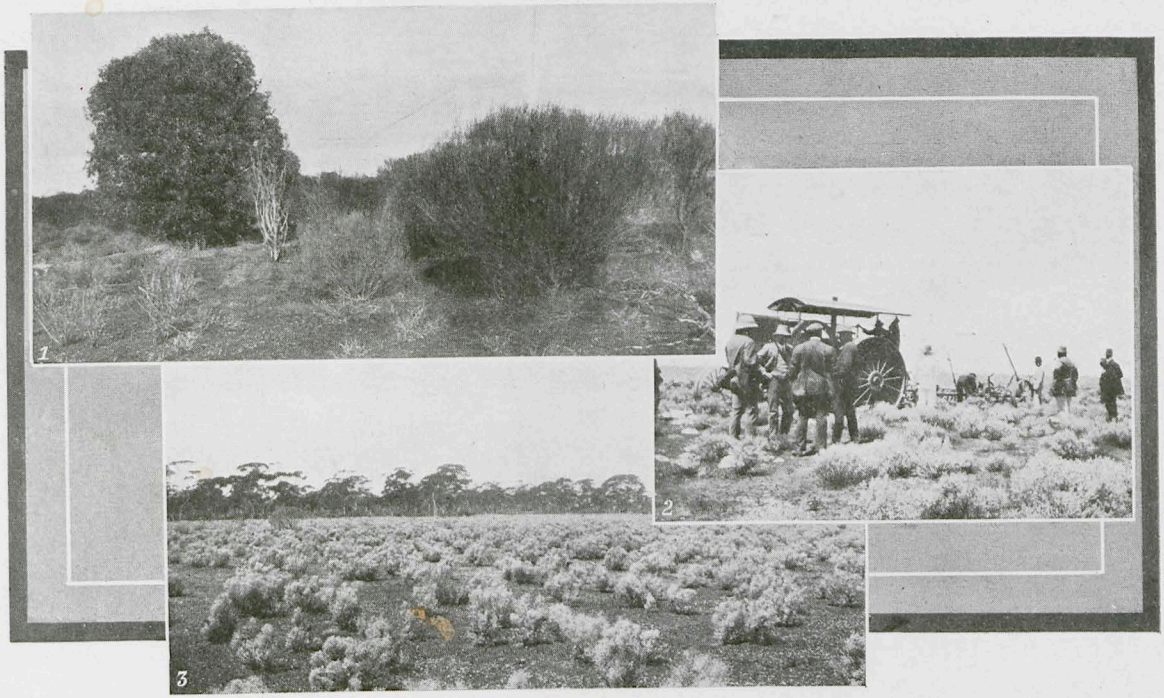


View of Nullarbor Plain, where Line runs 330 miles without a curve.

greater depth of soil collects, and these show, in spring, a luxuriant growth of grass and vegetation. As a rule they are small, only a few acres, but some of those near the western end of the plain contain hundreds of acres. Some of them are covered with grass a foot long waving in the wind and sprinkled with pink and white daisies and other flowers. These dongas become very rare over the great central area of the plain, but re-appear again in some numbers towards its eastern edge.

But the characteristic plants of the plain are the bluebush, with its ghostly colouring, and the saltbush, best of all native fodder plants, with its greyish-green leaves, salt, but not unpleasant to the taste. Alone or with a few kindred plants they cover almost the whole surface. Grass comes in the spring, but withers before the heat of summer ; but the saltbush and the bluebush go on for ever. No bush fire has ever come to sweep the surface of the plain ; at least there are no traces of fire to be seen. The saltbush and the bluebush are so constructed that their leaves absorb the moisture from every chance shower of rain, and when no rain comes they can drink in the dew that often falls heavily in these parts. Here and there a tiny dwarf acacia raises its spine-like leaves and yellow fluffy balls a few inches from the ground ; but it seems a stranger which has strayed into an uncongenial environment.

There is a fascination about these vast open plains different in kind to, but quite as great as, the fascination of the forest. For 330 miles the line runs without a curve. You look back, and the shining rails run on towards infinity till they seem to meet in the dim distance. You look forward and see the same twin threads drawn out till they melt into one another. Elsewhere there is nothing but the plain and sky. The plain rolls away to just such a circular horizon as the voyager by water sees when out of sight of land. By day the sun blazes in a heaven of cloudless blue, or flecked at most by a few white



(1) The Kurrajong and Broombush. (2) and (3) Saltbush Country, with Salmon Gum Forest in distance.

clouds, and beneath it sleeps the circle of earth, unbroken by hill or valley, by tree or house, or any of those things that we look for in ordinary landscapes. By day the sun's light floods the shadeless plain, and by night the moon and the stars blaze forth with a brightness not seen in moister climates, and under the moonlight the bluish-white and grey-green of the bluebush and saltbush look even more unearthly and ghostlike than by day.

What area the limestone covers is as yet unknown, and the limits of the plain to the north of the line have never been determined. Probably the plain has a total area of nearly 100,000 square miles, or more than the area of the State of Victoria.

The geology of this strange region is but little known, but it is obvious that where the plain now stretches the sea once rolled. The limestone was, of course, laid down under water; indeed much of it is full of the perfectly preserved remains of shells. Then by a great upheaval, with which is perhaps connected the great depression in the ocean floor across the Great Australian Bight, where soundings of 3,000 fathoms occur at no great distance from the shore, the old sea-bed has been raised to dry land once more. Even now much of this ancient sea-bottom retains so much of its original nature that the water which it yields is as salt as the sea, and sometimes a great deal saltier.

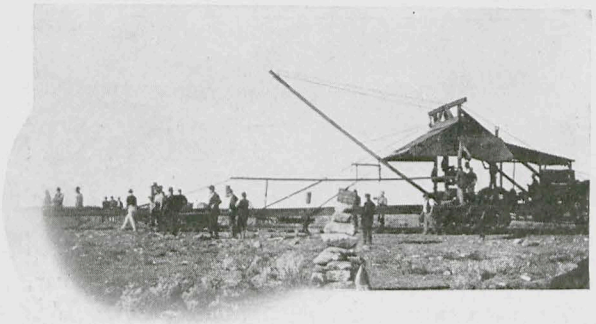
Such water as falls on the surface this limestone absorbs like a sponge, and beneath it is full of caverns and subterranean passages. A characteristic feature of some parts of the plain are "blowholes," openings in the surface communicating with the underworld. There is a constant circulation of air below, and sometimes the "blowholes" give out a strong current, while others of them suck it in. The best cave as yet discovered is Lynch's Cave (named after the first Federal Minister to visit it), about 2

miles from the railway station at Loongana, 337 miles out. Here there is a slight depression in the surface, notable because a needlebush some 7 feet high grows in it, and, in the middle of this, opens a round hole about 10 feet across. You climb down a ladder to the floor of the cave, 30 feet below the surface. The hole has opened out into a chamber 45 feet across, with dark passages and crevices leading from it, and a blow-hole in one corner, through which comes a strong current of air. On the walls salt glistens like diamonds, and stalactites, pink and yellow, grow in strange shapes, simulating fingers, walking-sticks, and many other articles, while many form a fretwork of marvellous delicacy.

A yet stranger feature of the plain is the presence on the surface, particularly on the more elevated parts of the limestone country, of pieces of natural glass. They are black in colour, hard and glossy, resembling the obsidian found in some volcanic regions. Some are shaped like buttons, others are in flakes or fragments. In some places they are comparatively numerous, but how they got there no one knows. There is no volcanic country for hundreds of miles around, and probably the theory that they have been driven upwards into the air by volcanic explosions and have fallen on the surface can be discounted. It has been suggested that they are of extra-terrestrial origin, a kind of cosmic glass, and have fallen as meteorites ; and that theory seems to be the one now more generally accepted. If so, they are fragments of matter which have reached the earth from outer space.

When 454 miles east of Kalgoorlie, the line runs across the border into South Australia. On either side of the railway is a small stone cairn marking the boundary, but there is nothing else to mark the change from one State to another, only the boundless plain stretching away to the horizon on every side. For 150 miles beyond this the plain rolls on until it begins to seem that it is without limit.

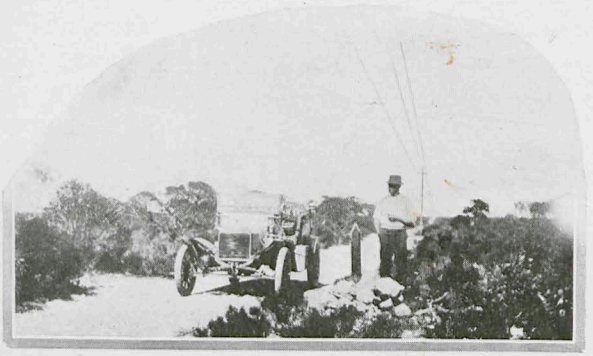
"WHERE EAST MEETS WEST."



The Tracklayer passing from Western Australia to South Australia.

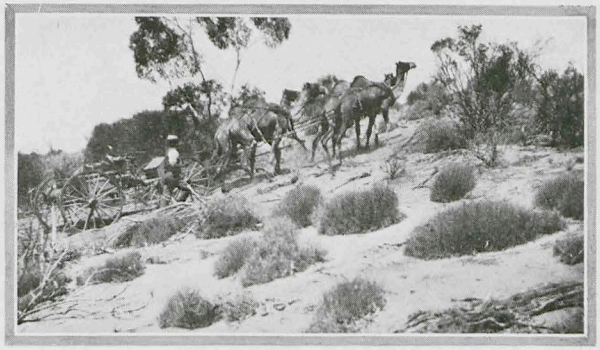
Then, over 600 miles from Kalgoorlie, you catch a glimpse of something different. From the top of a slight rise there come into view, rising dark and dim like clouds against the north-eastern horizon, long low ridges, outliers of the Musgrave range.

At the 605 miles from Kalgoorlie, a long "edge" runs north and south across the plain. You descend the slope to a depression 80 feet below, and the character of the country changes. There are real trees, small things of 10 or 12 feet high, but looking like giants after the bushes of the plain. Grass grows rank and green in the hollows, and the soil is deeper and contains more clay. After a few miles this country shades off into the sandhills, and the plain is left for good.



"Border Peg," on the Overland Telegraph Line.

The sandhill belt which begins at Ooldea is a tangled mass of ridges and hollows of a loose material which looks like sand, but is not real sand, but rather the accumulation through long ages of the fine dust blown off the plain to the westward. Unluckily for the railway, the ridges usually run north and south, at right angles to the line, and have to be cut through. In a state of nature there is nothing of the travelling sandhills about them. They are covered with a fairly thick growth of small trees, mallee gums, myalls, black oak, silky oak, native cork, and many others, scrub and bushes; but when the surface is cleared the soil is easily moved by the wind, and the bigger cuttings have to be faced with stone.



The Sandhills Country.

The Ooldea Soak, about 3 miles from the line, has an interest both historical and practical. In the middle of a bare, open, and most unpromising sandy hollow, surrounded by steep sandhills, a permanent supply of water is to be found a few feet below the surface; and, while the water got by boring on this section of the line is salt, the water here is perfectly fresh. Probably there is a clay-pan under the sand which holds up the water. It is only good for a few hundred gallons a day, but it has done good service both to explorers like Giles in 1875 and to surveyors and others who drew upon it in the earlier stages of the work on the railway.

The last division of the line, from the sandhills to Port Augusta, is more complex in its features and more varied in surface than any of the others. For about 100 miles, till the hilly country around Tarcoola is reached, the line runs across red-soil plains and undulating country. It is for the most part well timbered with black oak and myall and occasional eucalypts, and well grassed. From the size of the timber it would appear to have more rain than the country nearer Port Augusta. It is certainly fine pastoral country, and may yet be used for agriculture.

Mule Team conveying Mails over Lake Hart.

At Wynbring, 321 miles from Port Augusta, the granite, which has been hidden for 560 miles, again comes to the surface. A mile or so from the station a low rounded mass of granite, like a bare skull, rises above the trees.

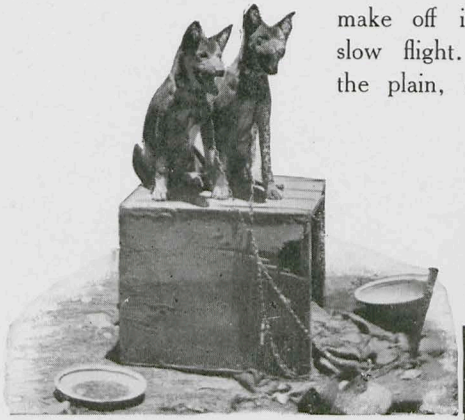
Fifty miles further on is the first fence which the line has crossed since leaving Kalgoorlie, the outer boundary of Wilgena Run. Wilgena is a fair size, even as runs go here, for it is 80 miles long by 40 miles wide, with an area of 3,000 square miles. On a corner of it is the Tarcoola Goldfield, where the rocks come to the surface in low but rugged hills. The hills die away again, and then comes the "Lake Country." It is true that the lakes are but vast shallow pans, some of them hundreds of square miles, covered with a shallow sheet of water after rains, but in the dry season mere beds of salt stretching away mile after mile. Yet somehow this shallow salt water has a blue like the blue of

the sea, and the lakes are picturesque enough with their waters gleaming in the sun and surrounded by bluffs and mimic cliffs, with wooded slopes beyond. Of Lake Hart the line crosses a corner, and later it skirts the shores of the Island Lagoon, which has a remarkable hill, peaked like a miniature volcano, standing in the midst of it. The happily-named Lake Windabout the line crosses too, and beyond is Pernatty Lagoon, the waters of which are impregnated with copper. Then comes 50 miles or more of plain country, with strange flat-topped hills rising to the south-west, the remnants of a once continuous tableland, and the line runs across the extreme head of Spencer Gulf at Yorkey's Crossing and reaches its eastern terminus at Port Augusta.

"The Wandering Aborigines."

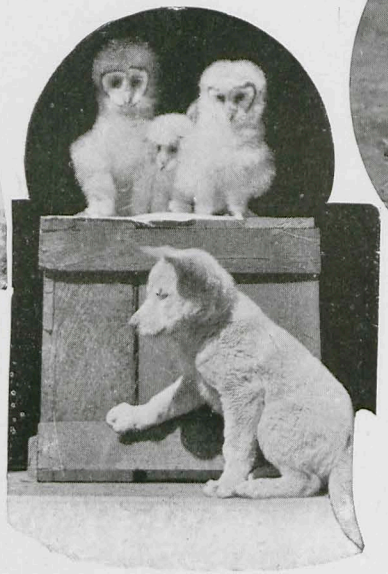
ANIMAL AND BIRD LIFE.

The largest native animals on the plain are the dingoes, which establish themselves in the limestone holes and caves, and are fairly common. Of kangaroo and wallaby there are no traces except in the scrub country of the sand-hills. Rabbits are numerous everywhere. Away beyond all traces of settlement, where the only human inhabitants are a few wretched aborigines wandering in small mobs with their dogs and their families from rock-hole to rock-hole, and sucking the roots of the trees and bushes, or licking the dew off the trees and grass when other water supplies fail, the rabbit is quite at home.

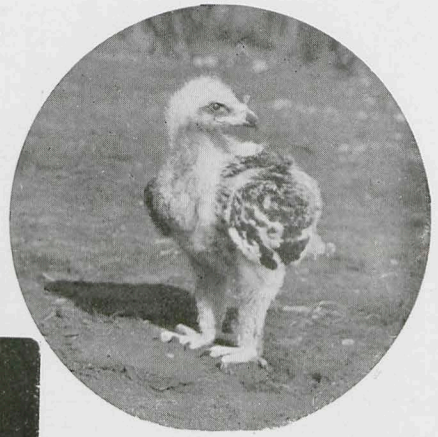


Young Native Dogs.

make off in stately but by no means slow flight. Quail are met with on the plain, and at night one hears the



Cave Owls and Dingo Pup.



An Eaglet of the Nullarbor Plain.

Bird life is fairly plentiful. That magnificent specimen, the Australian bustard, sometimes called the plain turkey, ranges far and wide over the plain, and birds up to 25 lbs. in weight have been secured. Occasionally flocks of from 20 to 30 bustards will rise near the line and mournful wail of the curlew, the cry of the plover, and in the spring time the flight of wild ducks. Sometimes, too, that inveterate fisherman, the cormorant or shag, drifts out on to this great sea of grass and

bushes, where there is neither water nor fish. Swallows are everywhere, even in winter, and such small native birds as wrens and finches are common enough. The sparrow has not yet reached the plains, but it is coming. It has worked as far west as Tarcoola, and it has been reported that one was seen at Ooldea—200 miles still further west. Birds of prey are strongly represented. Huge eagles hover aloft on the look-out for rabbits, and smaller hawks also are common. The limestone caves house white owls of a variety apparently confined to this region. They are described as pure white in colour, except for a fringe of blackish feathers around their cat-like faces and some brown feathers on the wings.

WATER.

In considering the potentialities of the immense tract of country opened up by the line, the one outstanding fact to be borne in mind is that it is a region with a very small rainfall, probably no part of it has an average rainfall of as much as 10 inches a year. In exceptional years much of the country may receive more than 10 inches, but there are other years when the fall is probably very much less. The absence of water along the route was one of the main obstacles to construction. At Kalgoorlie water could

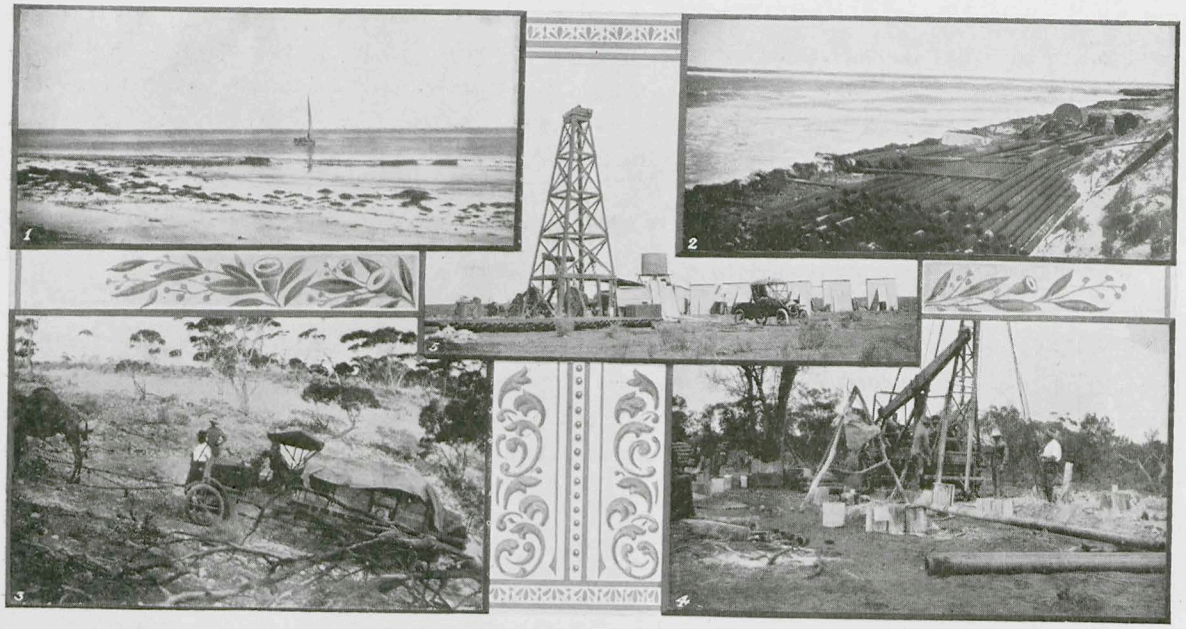
"Saunders' Weir," Depot Creek, in the Flinders Ranges (Eastern End).

Mundaring Weir, the source of Kalgoorlie's Water Supply. Water pumped from the Weir in the Darling Ranges, a distance of approximately 350 miles.

be obtained from the Western Australian Government Supply Scheme, which conserves water at the Mundaring Weir and pipes it for 350 miles to Kalgoorlie; but at the Port Augusta end the supply available was that used for the town of Port Augusta, and was insufficient. Between these two points, and even at Port Augusta itself, suitable supplies had to be secured. So far as Port Augusta was concerned the problem was solved by drawing upon a spring in Depot Creek—25 miles away. This creek, already referred to in an historical sense, has never been known to fail even in the worst droughts. In a romantic gorge in the heart of the hills, 1,000 feet above sea-level, a weir (known as "Saunders' Weir," after its designer, Capt. F. W. T. Saunders, the Supervising Engineer of the eastern section of the line) was built, and from this a pipe line now delivers 60,000 gallons a day at Port Augusta.

When the question of water supplies between the two terminals was taken in hand it was seen that for the greater part of the way nothing could be hoped from the building of dams. The rainfall indeed, as far as the scanty records and observations go, is fairly uniform throughout; but over the limestone country and sandhill region, which together extend from a point 167 miles east of Kalgoorlie to within less than 400 miles of Port Augusta, there is under normal circumstances no "run-off." Except in very abnormal rains the water which falls soaks into the soil. For over 100 miles to the east of the sandhill country, too, the surface is so flat and the soil so absorbent that there was no hope of successful dam building. The collecting of the surface water in dams has therefore been confined to two short lengths of the line—the first 150 miles at the western end, and the first 250 miles at the eastern end. Along these 400 miles storage has been provided for 50,000,000 gallons, of which 17,000,000 gallons is in the west. Practically everywhere that the work of conserving water on this line has been attempted it has been successful. The dams have filled well, and would in some cases have filled if they had been ten

PIONEERING WORK.



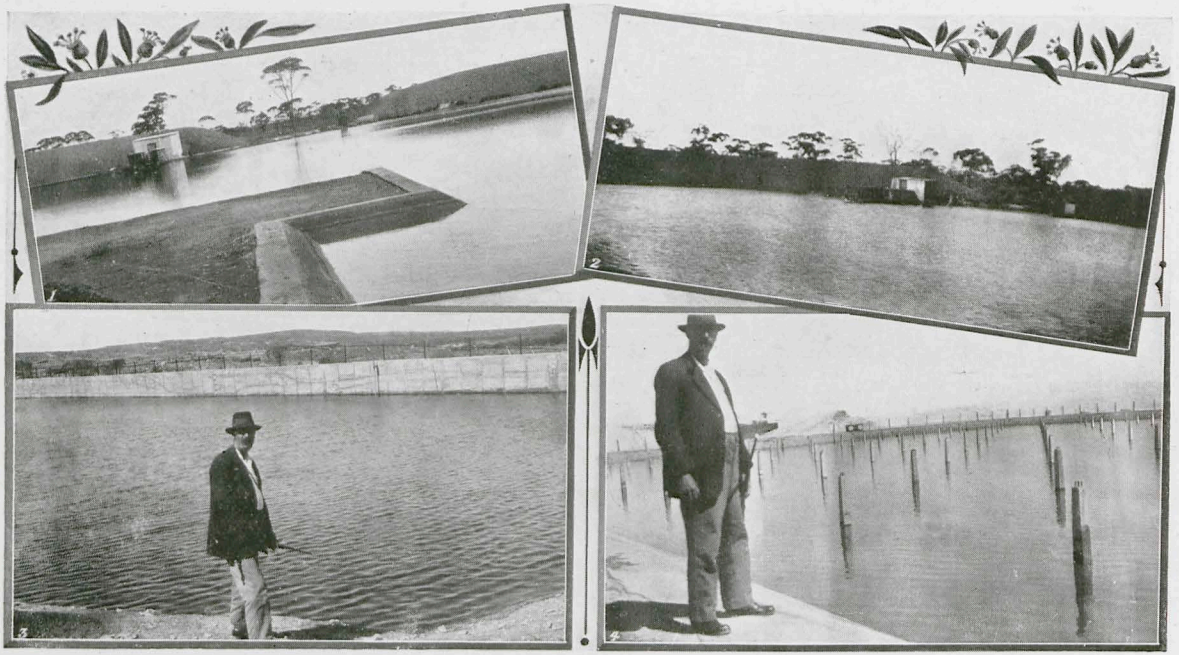
(1) Schooner with Boring Material approaching Shores of the Bight. (2) The Material Unloaded on the Shore.
(3) Camels Dragging Motor and Equipment up the Cliffs.
(4) and (5) Boring Party at Work on the Route of the Railway.

times as large. Generally speaking, also, they give water of better quality than that yielded by bores and wells. Nevertheless, it is the wells and bores that have really seen the line through. At Kingoonya, 210 miles from Port Augusta, two wells put down on the floor of a broad valley have given as much as 120,000 gallons in 24 hours, and have been drawn upon for 60,000 gallons a day over long periods. This water is struck at 57 feet below the surface, in a stratum of pure sand. At the present time the water from these wells is carried over 200 miles along the line.

A good supply of water was struck under similar conditions near Wirraminna, 157 miles from Port Augusta. Indeed, the wells here and at Kingoonya tap what may be looked on as natural underground reservoirs, which have this great advantage—that loss by evaporation is reduced to a minimum, since the water lies beneath many feet of earth.

Over the Nullarbor Plain and amongst the sand hills boring has to be relied on, and it has given better results than were at one time thought likely. Altogether 27 bores were put down along the 445 miles of line lying between Naretha, 205 miles out of Kalgoorlie, and a point 402 miles from Port Augusta. The depths are mostly between 200 and 600 feet, though one or two bores have been driven right through to the underlying granite, which in one case was struck at 1,470 feet. The bores yield nearly 300,000 gallons of water per day, but unfortunately its quality is not uniformly good. On one stretch of nearly 150 miles every bore put down has given salt water, while in a number of other cases the water, though good enough for stock, contains ingredients which make it unfit for locomotive use. At 539 miles from Kalgoorlie, and at 420 miles from Port Augusta, condensing has been resorted to to give a regular supply of fresh water.

WATER SUPPLY.



Views of Tanks Constructed along the Route of the Railway.

PASTORAL AND MINERAL OUTLOOK.

Of real desert, such as may be seen in some parts of Central Australia, there is not a trace on this line. The nearest approach to it are the sand hills, but even these support a growth of trees and shrubs by no means to be despised. The Limestone Plain, which forms so large a portion of the country, is well covered with saltbush, bluebush, and other shrubs and herbs. Such familiar and homely plants as tomatoes, melons, and pumpkins, given a little rain, run almost wild, and the former ripen all the year round. At a now deserted camp near Naretha these plants had been put in a little hollow and given a drop of water. At the end of July, though they had received no attention for nearly six months, the tomatoes were flourishing and yielded excellent ripe fruit, some of them over half a pound in weight. Pumpkins and melons, too, were to be had here for the picking. Grass grows so abundantly at times that quantities of it have been cut as hay to supply the horses used on construction work. The development of the country will depend for a long time to come on the pastoral industry and on mineral possibilities. Of its type there is not much finer pastoral land in Australia than some of the saltbush country. To those used to well-watered regions the stock which this new country will carry seems trifling, and it would be a fatal mistake to overstock it ; but there is no sounder and healthier country than the limestone plain, and so great is its area that even with only a few sheep to the square mile the aggegate which could be carried runs into millions. Apart from the plain, much of the other 100,000 square miles and more which the line opens up is fair pastoral country of the dry type.

The greatest difficulties in the way of pastoral settlement in this region are not the water, which can generally be obtained, or the climate, which is good, but the dingoes and the rabbits. The rabbits

could probably be kept fairly well in hand by strict control of the water supplies ; but the dingoes are more dangerous, and the experience of the country around Port Augusta seems to show that only fencing can overcome them. But that these disadvantages can and will be overcome, however, now that the country has been opened up, there need be no doubt.

A Self-sown Crop on the Route of the Railway.

Agriculture is a matter of the more distant future. There are thousands of square miles along the line that will grow anything with water ; but there is no possibility of irrigation at present, except on a tiny scale in one or two favoured spots. The growth of self-sown wheat and oats proves that splendid crops could be grown on the rich red-soil flats about 100 miles out of Kalgoorlie and elsewhere along the line ; but the experience of the rainfall is yet too limited to determine as to average prospects, taking one year with another.

The known mineral wealth of the country is mainly along the eastern section, extending for about 300 miles from Port Augusta. It is true that the first 100 and odd miles are in the gold-bearing belt of Western Australia, and that some good auriferous finds have been made along the route ; but the known resources of the eastern country, which contains a wide variety of metalliferous rocks, are far greater. About 260 miles out from Port Augusta is the Tarcoola Gold Belt, first discovered seventeen

years ago, and worked under enormous difficulties until the railway was built. This and the neighbouring Glenloth field have yielded, in spite of all disadvantages, about £200,000 worth of gold. Nearer to Port Augusta is a large area of copper-bearing country, of which which Mount Gunson is probably the most important. Manganese worked about eight miles from the Woocalla Station is now being carried over the line in considerable quantities. Molybdenite and other of the rarer metals are said to exist in the continuation of this mineral belt to the north, and, in the Stuart Ranges away to the northward of Tarcoola, it is said there is a fine deposit of opal.

The truth is that most of this country is so little known that no man can say what it may contain. With the railway line as a base, prospectors can now reach that series of ranges, the Warburton, the Everard, the Mann, and the Musgrave, which stretch eastward across the interior of the continent away to the northward of the line. Already prospectors, aided by a loan of Commonwealth camels, have gone out from Naretha to the Warburton Ranges, the westernmost of the series, and this expedition may be safely regarded as the forerunner of many others. Incidentally it might be mentioned that the famous Iron Knob, of the ore from which hundreds of miles of the steel rails used in the construction of the line were manufactured, lies only about 40 miles to the south-west of the line, on the shores of Spencer Gulf.

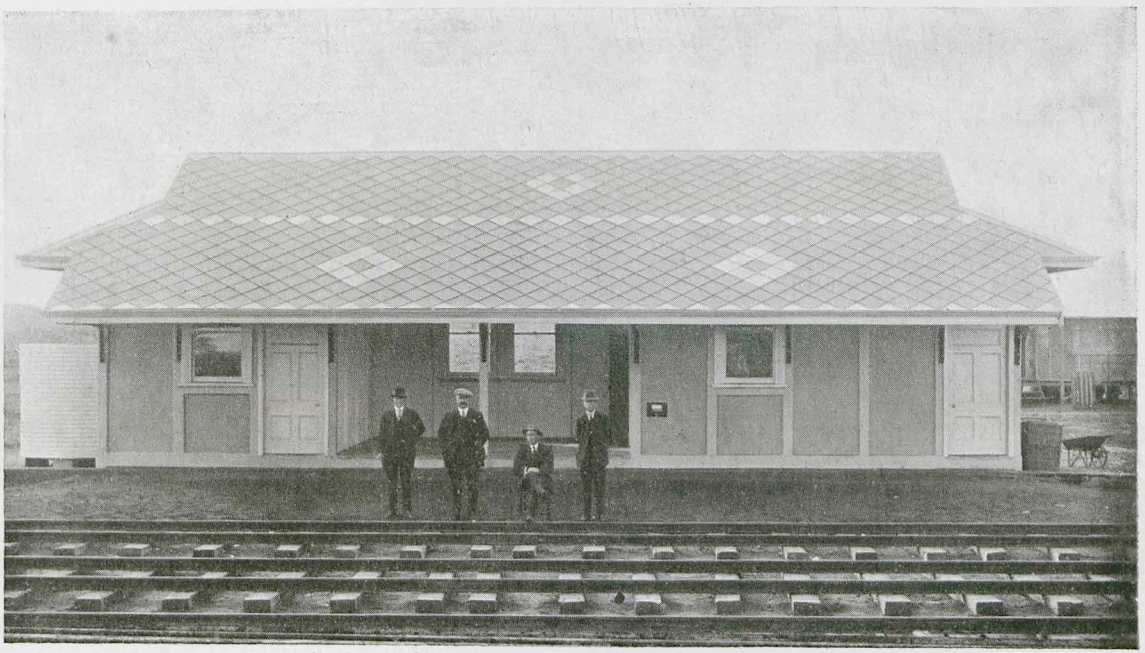
TRAIN SERVICE.

When the line is ballasted throughout, a work which will probably take another year or so, it is anticipated that the express train service through between Port Augusta and Kalgoorlie will occupy 24 hours, which means an average speed, including stops, of 44 miles an hour. The line is designed for high speed traffic, and this speed will compare with other express train services in Australia as under :—

	Average per hour.
Melbourne to Sydney	34 miles.
Melbourne to Adelaide	27½ ,,
Sydney to Brisbane	25¼ ,,

But for the present, until ballasting is completed, the average speed will be only about 30 miles an hour, giving approximate'y a 35 hours' journey between Port Augusta and Kalgoorlie. First and second class sleeping cars are provided, as well as dining and lounge cars, and every effort has been made to secure comfort as well as speed.

Unfortunately the chaotic conditions of the railway gauges of the Australian States —a condition which has been growing worse even while this line has been under construction—is likely to have a serious effect on the efficiency of this great highway. Until the difficulty is overcome its strategic value in case of emergency will be enormously reduced. Still the construction of the line is a noteworthy step along the path of national progress, and when the two ends of steel which have for four years past been pushed into the wilderness—one from the east and one from the west—met in the midst of the vast solitude of the eastern end of the Nullarbor Plain, a road was established which may fittingly be regarded as the first truly Trans-Australian Railway.



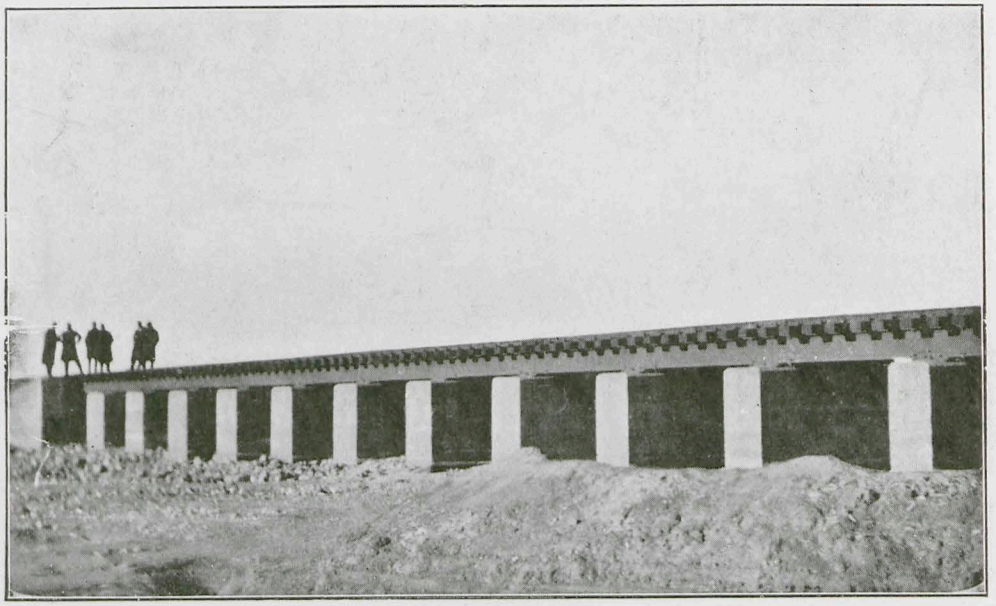
Tarcoola Railway Station.

"Hundreds of camels found a place on the works."

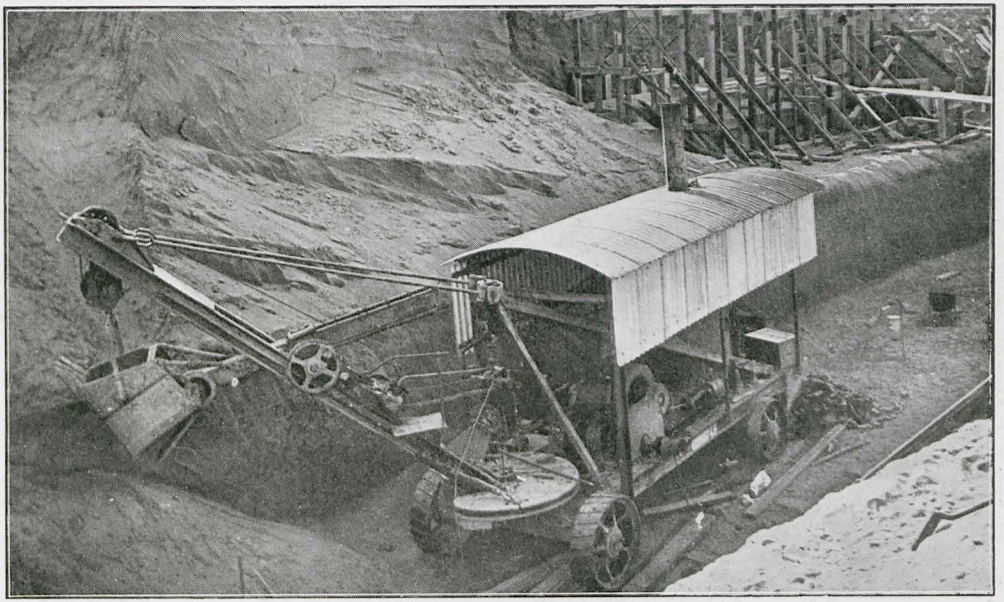
Camel Buggy leaving Kalgoorlie in the early stages of the Work.

Camp Train, including Office Car, Store Car, and Hospital Car.
"As the rails reached out, so this train advanced."

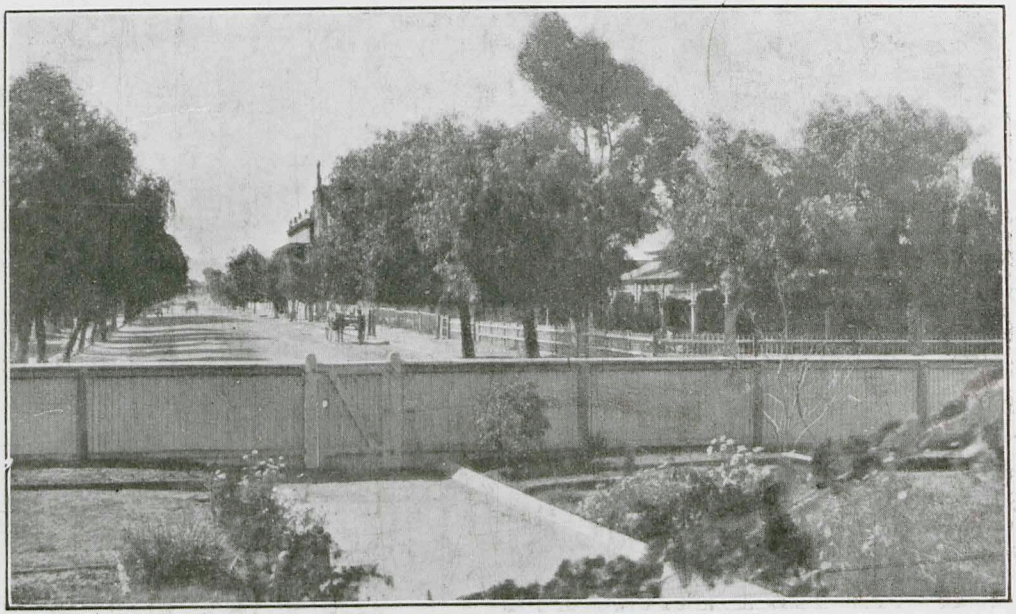
A Typical Roadside Railway Station.



Crossing the Head of Spencer Gulf, near Port Augusta.



Steam Shovel for use in Excavations.



Chapel Street, Port Augusta.