NEWS. 13. 11. 28. Continued NEWS. 9.

NEW MURRAY BRIDGE

ssive Steel Structure Opened by Premier

UMPH OF SOUTH AUSTRALIAN ENGINEERING AND SKILL

The new railway bridge over the Murray, for which there been an urgent need for several years, is an accomplished t.

Just south of the old structure at Murray Bridge there ns the stream a steel bridge 1,900 feet long, capable of rying the heaviest rolling stock the Railways Department put over it.

The cost of the bridge is approximately £215,000. The old icture cost £130,376. Two years have been spent in building new bridge, compared with six years in erecting the old .

The opening ceremony was performed by the Hon. J. Gunn remier) today in the presence of a large party of members Parliament, railway officials, and townspeople of Murray idge.

years the huge cylinders on which portion of the old bridge which the reclaimed Burdett swamp on astern side of the river rest, have steadily sinking, and have caused no trouble. The Railways Depart- had been compelled to maintain a watch over the defective section to it stable for the increasingly heavy which crossed it.

h the opening up of the mallee ry east of the Murray it was appa- that a new structure must be d. A definite decision was delayed to uncertainty whether Murray e or Tailem Bend would eventually osen by the Railways Department as capital" of the Murray for its pur-

ntually it was decided that the rn headquarters should be main- at the firstnamed town, and plans ie construction of the new bridge accordingly drawn.

completion of the new structure s an important advance by the Rail- Department, which, since the ap- ment of Mr. W. A. Webb as Chief ays Commissioner, has made many le steps forward. Traffic to the rn States, the South-East, and the ay lands will be expedited. Train over the old bridge had to be limi- and between Murray Bridge and m Bend the heavy gradients more once proved too steep for the class gine used to haul trains. The size ie engine was an important conside- n to railway officials.

ese difficulties will now disappear, and heavier trains which it will be pos- to use on the southern line will ex- te the handling of traffic, and enable department to lift the Murray lands rest much more quickly than has erto been the case.

LIKE HUGE MECCANO TOY

is worthy of note that the bridge was igned by and built under the super- on of Mr. R. H. Chapman (Chief En- eer for Railways), who is a South Aus- lian. The bridge was fabricated in a th Australian steelyard.

Mr. Chapman is a son of Professor apman, of the Adelaide University. He d a brilliant scholastic career. Since appointment as Chief Engineer he s given ample evidence of his excep- nal engineering attainments. The lding of such an important structure a remarkable achievement for a young gineer.

The structure was fashioned from raw aterial in the engineering shops of ssrs. Poole & Steel at Osborne. The idge was placed on the bank of the rray in sections, like those of a huge ccano set. The work of assembling the spot consisted of setting the units the massive concrete piers, and rivet- g the girders together.

Blue prints of plans drawn under the rection of Mr. Chapman formed the sis of the structure. There were many these, drawn accurately to scale, and owing every truss, stay, gusset, and vet.

In the pattern loft at Osborne on the rgest floor of its kind in Australia, ac- rate replicas of the forms shown on ese plans, of the actual size needed for e bridge, were drawn on sheet zinc. ery measurement was checked to the action of an inch. Where a rivet hole as required a hole was punched in the attern. The zinc was then cut to the ape of the gusset or other piece it re- resented.

Hundreds of different patterns were thus made from the plans, and then on the ground floor of the shop men placed the zinc patterns on sheet steel and chalked them in. With steel-pointed tools the outline was scribed into the sheet and a punch mark made in the exact centre of each rivet hole. The steel sheet was handled over to the power shears by a travelling electric crane, and the metal snipped to the desired shape, much the same as cardboard might be cut by scissors. Then the shapes went on to the drills to be pierced with rivet holes.

For ordinary steelwork such as ship-building rivet holes are punched out of the metal like scones from dough, by great machines, but bridge building calls for such accuracy on account of the loads to be carried and stresses borne, that every rivet hole in the structure must be individually drilled. For this purpose at Osborne twelve radial drills were utilised.

Some idea of the number of holes required to be drilled can be gathered from the fact that 114,000 rivets were put in the large truee span alone.

In the erecting shop the various constituent parts were brought together and the bridge began to assume shape. Cranes swung the heavier steel pieces into position. Then the pneumatic rivetting machines started their work. A red hot rivet was placed in the hole intended for it, and with the clatter of a maxim gun the rivetter battered the rivet end into a dome that held the two joined pieces of steel as in a vice. This process was repeated many thousands of times. Nearly 100 tons of rivets were used in the bridge.

The eighteen approach spans are each formed of two huge fabricated steel girders 70 feet long and 7 ft. high. Each span weighs 36 tons. The great girders were railed from Osborne to the bridge site.

The weight of the large 214 ft. span is about 317 tons, and that of the two 185 ft. spans approximately 208 tons each.

All the fabricated material as it was completed at Osborne was sent forward to Murray Bridge by rail.

MURRAY BRIDGE CELEBRATES

It was not at first intended to have an official opening ceremony, but the townspeople of Murray Bridge considered it such an important occasion that they prevailed upon the Government to mark it in a manner befitting the dignity of the second largest country town in the State.

Today the river town was gaily decked, and residents for miles round made a huge picnic of the historic event. The special train which proceeded from Adelaide this morning carried a large party of politicians and railway officials to the river town.

Those who left Adelaide on the special train this morning were the Hon. J. Gunn (Premier), Messrs. W. A. Webb (Chief Railways Commissioner), J. McGuire (Railways Commissioner), A. N. Day (Railways Traffic Manager), G. J. Smith (General Superintendent of Railways), F. J. Shea (Chief Mechanical Engineer), R. H. Chapman (Chief Engineer for Railways), S. A. Watson (Superintendent of the Adelaide Division), C. J. Boykett (secretary of the Railways Commissioner), R. R. Stuckey (Under Treasurer), C. B. Anderson (assistant Chief Engineer of Railways), Mr. Legh Winser (private secretary to the Administrator), F. L. Parker (Clerk of the House of Assembly), A. H. Poole (of Poole & Steel, who placed the steelwork on the bridge), the Hon. A. P. Blesing, M.L.C., and Messrs. H. C. Richards, E. Anthoney, R. D. Nicholls, P. T. Heggaton, and S. Verran, M.P.

CREW OF FIRST TRAIN

The following is the crew of the first train to pass over the bridge:—J. C. Allen (engine-driver), O. Heberlie (fireman), and H. Addy (guard).

On arrival of the train at Murray Bridge at 12.20 the party was welcomed by Mr. M. W. Parish (Mayor of Murray Bridge, and a former representative of Murray in the Assembly), members of the local corporation, and a large concourse of people. Included in the large assemblage were Mr. F. W. Jaensch and Mrs. Hill (who rode in the first train which crossed the old bridge). Mr. Jaensch, a fine-spirited townsman, has given many blocks of land for public purposes.

Included in the party were Sir Lancelot Stirling (President of the Legislative Council), Hons. J. Cowan, J. Carr, and R. T. Melrose, Ms.L.C., Mr. Staniford, M.P., and the Hon. P. McMahon Glynn.

There was an attendance of between 4,000 and 5,000. High school children formed a guard of honor under Mr. A. R. Hilton.

Mr. Parish requested the Premier to declare the structure open, and Mr. Gunn did so.

To the accompaniment of selections by the Murray Bridge Band, under Mr. C. Power, the train amid loud cheering, travelled over the new bridge, cutting the ribbon in its path, and returning to the railway station.

The visiting party was subsequently motored round Murray Bridge and environs, and ample evidence was afforded of the rapid expansion of the town in recent years.

Luncheon was served in the railway refreshment rooms. The toast "Parliament" was submitted in appropriate terms by the mayor.

STORY IN FIGURES

In responding the Premier said that the new bridge, which was 1,900 feet long and contained altogether 1,540 tons of steel, was designed to carry heavier locomotives than any other bridge in Australia. There were 12,000 cubic yards of concrete in the sub-structure, and about three chains of tunnel and 60,000 cubic yards of cutting. Each piece in the stream was founded upon two 16 feet diameter caissons, which in turn were founded on granite at a depth of about 84 feet below water level. These cylinder caissons wer sunk by men working under air pressure up to about 35 lb. Each of the swamp piers rested on 53 piles from 70 to 75 feet long.

The location and borings were begun in September, 1923, and approximately 40 borings were put down before the alignment and position of the piers was finally decided, so that the location, design, and construction had been completed in a little more than two years. The period would have been reduced by four months had it not been for delay with the steelwork owing to the holding up of the steamer Volumnia.

The total cost of the bridge would be about £215,000, of which £26,000 was for the tunnel and earthworks in deviation.

The new bridge was the largest work of its kind that had yet been accomplished in South Australia. A pleasing feature about the construction was that it was designed by an engineer who was born in South Australia and received his training in Australia—Mr. Chapman—and was constructed wholly by the Railway Department.

The workmanship demonstrated the efficiency of both supervising staff and the men engaged in the actual work of carrying it out, and the lesson to be learned from it was that South Australian artisans and workmen were equal to any other part of the world. What was wanted was a little more faith in themselves so that they might do more of their own work in Australia. (Applause.)

"The South Australian Railways, coupled with Success of the New Bridge" was submitted by Mr. F. Jenkin (president of the Progress Association), and responded to by Mr. R. H. Chapman.

The special train left Murray Bridge at 3.55 o'clock and will reach the city at 6.2

WIRELESS IN LABORATORY

Professor Kerr Grant Lectures

Professor Kerr Grant, of the Adelaide University, delivered a lecture on "The Value of Wireless in the Laboratory" at a meeting of the Railways Radio Club.

He illustrated that an instrument devised for one special purpose frequently found other applications, some of which might be more important than that for which its inventor designed it. That was exemplified in the case of the wireless valve, originally developed by Fleming of London and de Forest of New York, for reception of wireless signals. It had now found a multitude of uses in physical measurements.

After describing the original Fleming two-electrode valve Professor Grant explained its fundamental property. Current, he said, could pass through it in one direction only. Thus it could be applied for rectifying alternating current. Modern two-electrode valves as built by the General Electric Company, of America, and many other firms, could rectify alternating voltages up to 100,000 or even double that figure, and possess high efficiency. A convenient source of high tension direct current for laboratory uses could be obtained by a combination of a high tension transformer of valve rectifier.

The direct current voltage was not steady, but could be smoothed out by including inductances and condensers in a suitable way, he said. The Coolidge X-ray bulb when operated direct on a high tension transformer, was self-rectifying in the same way as a two-electrode valve. By the introduction of a third electrode, the credit of which was assigned perhaps somewhat doubtfully to Lee de Forest, the vacuum valve became a much more delicate and versatile implement. The use of the second or B battery in the plate, the merit of which rightly belonged to de Forest, was also a great improvement.

Action of Human Will

"The third electrode converts the valve into a true electron relay by means of which the stream of electrical energy may be controlled with an almost incredible minimum of power. No other physical appliance approaches so nearly in this respect the action of the human will," said Professor Grant.

He proceeded to illustrate the uses of the valve in laboratory measurements. Measurements of inductance and capacity could be made with far greater accuracy and ease than heretofore by employing valves to generate, and amplify alternating currents. The "wave meter" was a tool of the greatest value, not only in technical but in scientific application. It could be used not only to measure wave-lengths but also for rapid and accurate measurements of inductance and capacity.

The measurement of A.C. voltages and currents of small magnitude, especially if their frequency were high, could not be effected accurately by the instruments employed for A.C. measurements in power systems. By combining a three-electrode valve with a multi-ammeter or more sensitive A.C. instrument, such voltages or currents could be measured with the same facility and precision as D.C. quantities. The valve voltmeter deserved to be much more widely known and used.

Measuring Movements

"Another interesting application of the valve is the measurement of minute distances," he said. "Professor Whiddington, of London, and Dr. Dowling, of Dublin, had each invented 'ultra-micrometers,' making use of the valve. Bowling's system is perhaps the more convenient. That inventor has succeeded in measuring movements as small as the 2-millionth part of an inch. The growth of a plant bud in a few seconds, or the extension of an inch of steel rod when pulled with the force could thus be measured."

L. B. Turner, he said, had based a marvellously sensitive relay on the principle that the plate current of a valve increased with a sudden jump when the valve, with properly arranged circuits, began to generate oscillations. Such relays could be operated by a beam of light or by a sound. He had used one which would ring a bell when he told it to do so.

Adv. 13. 11. 28.

ELDER CONSERVATORIUM.

"The Magic Flute" opera (scene I) to be produced at the Norwood Town Hall on Friday next by the Elder Conservatorium Opera Class, is one of the most interesting works of Mozart, and was composed and produced in the year 1791. The opening of this opera is cast in the conventional style of the period, being mystical and fantastic. The scene is laid in Egypt, and deals with the story of Tamino, and the Queen of Night, the other principals being Papagena, the bird catcher, and three lady attendants. The musical conception of the work is remarkable, in that it left the traditional lines of Italian opera then in vogue, and ventured out in o new paths which laid the foundation of the great school of German opera. In this opera Mozart reached perhaps his greatest heights. The charm, the vitality, the exquisite melodiousness, and the deeply-emotional value of this music every proclaim his genius, and have stamped opera as one of the greatest of all time In addition to this scene, the full opera of "Dido and Aeneas" will be staged in costume by the class, under the direction of Mr. Clive Carey, Mus. Bac. A chamber orchestra of 22 performers under the leadership of Miss Sylvia Waltington will company the opera and ballets, which have been arranged by Miss Phyllis Telfer. Plan at Marshall's, Gawler

Rec. 12. 11. 28

UNIVERSITY SHAKESPEARE SOCIETY.

The University Shakespeare Society will close its forty-second session to-night in the south hall of the Elder Conservatorium, with recitals from Shakespeare's plays. The recital will be preceded by music and dancing, by members of the Sylvan Salon, under the direction of Mrs. Vivienne Powis Stuart. A special item will be "The foresters' song," "Blow, blow, thou winter wind," by Mr. Dever Brock. Proceedings will begin at quarter to 8 o'clock, in the South servatorium Hall. Past and pers and friends will be