

the Goodradigbee rivers receive considerable accessions in volume from the melting snows in the vicinity of Kiandra. A dam is proposed to be built that would impound 28,000,000,000 cubic feet, and in order to realise what such an enormous volume of water means, it might be pointed out that the lake would contain one and a half times as much water as Sydney Harbour. The water would be backed up the Murrumbidgee River for 41 miles, the Yass River for 25 miles, and the Goodradigbee River for 15 miles, and would submerge an area of 8,320 acres. The catchment area above the Barren Jack dam is 5,000 square miles of probably the most effective gathering ground in this State. The height of the dam would be 200 feet, the length along the crest 900 feet, the width of the crest 20 feet, and the maximum breadth of base 230 feet.

With regard to the Lachlan, a river which in time of drought is frequently a chain of waterholes, it is absolutely essential that the flood-waters be stored, otherwise irrigation on even a limited scale is not at all times possible. An excellent site for a storage basin is situated between Cowra and Mount McDonald, and a short distance below the confluence of the Lachlan and Abercrombie rivers. The catchment area is 3,200 square miles, and a dam 155 feet high would impound 12,000,000,000 cubic feet, or about twelve times the effective gravitation supply of the large reservoir that supplies the city of Sydney with water. About 6,000 acres of land would be inundated, and the water would be backed up by the Lachlan River for 18 miles and the Abercrombie

Plate 60.



LAKE TAILS, N.S.W.

River for 19 miles. It might be pointed out that any improvements on the Lachlan River would be wholly in the interests of New South Wales, as it is not possible for the trade to be diverted outside the State. As there are large areas of irrigable land on the Lachlan, it is important for many reasons that the reclamation of portion of this land should receive early consideration. Assuming that this reservoir had been in use during the past ten years, it would have been full at the end of 1901, and instead of a dry channel beyond Condobolin, there would have been a volume of no less than 20,000 cubic feet per minute available for distribution. This would have given a stock and domestic supply as far as Oxley, after having made all possible allowances for losses by soakage and evaporation.

PREMIERS' CONFERENCE.

In a paper of this description, which deals with the question of navigation and irrigation, it may be considered advisable to explain the provisions of the Premiers' agreement, and its subsequent modification. It is apparent that, under natural conditions, the interests of the upper riparian States are opposed to those of South Australia. The construction of locks and weirs would at once solve the whole difficulty, but the trade of the rivers is so small that a complete system of locking, which would involve an expenditure of two and a half millions, could not reasonably be entertained. The question, therefore, before the Premiers was the distribution of the waters under natural conditions. The published report of the conference will show that many days were spent in discussing the question without any definite result, and it seemed as though the Conference would terminate without reaching finality on the Murray question; a compromise, however, was effected on the concluding day of the sitting.

In the report of the Inter-State Commission, the first and most important resolution, which was agreed to unanimously, pointed out that the navigation of the lower part of the main river, and of certain portions of the larger tributaries, would eventually be provided for by the construction of locks and weirs, and until the initiation of such a system of works, the upper riparian States should restrict their total diversions to about 440,000 cubic feet per minute from July to January inclusive, and during the months February to June inclusive to about 370,000 cubic feet per minute. It also provided that the diversions should suffer a *pro rata* reduction when the river at the South Australian border fell below 170,000 cubic feet per minute from July to January, and when it fell below 70,000 cubic feet per minute from February to June inclusive.

Locks and
Weirs.

Apportionment of Water by Inter-State Royal Commission. The second resolution of the Inter-State Commission apportions the water among the States in terms of resolution No. 1, the allotment being as follows:—

FOR THE SEVEN NAVIGATING MONTHS.

	Cubic Feet Per Minute.	=	Cubic Feet in Millions.	Per Annum.
New South Wales	292,000	=	90,403	37·7 per cent.
Victoria	240,000	=	45,201	18·8 „
South Australia.....	337,000	=	104,335	43·5 „
			<hr/> 239,939	100 „

FOR THE FIVE NON-NAVIGATING MONTHS.

	Cubic Feet Per Minute.	=	Cubic Feet in Millions.	Per Annum.
New South Wales.....	240,000	=	51,840	54·9 per cent.
Victoria	127,000	=	27,434	29·1 „
South Australia.....	70,000	=	15,120	16·0 „
			<hr/> 94,394	100 „
			<hr/> 334,333	

Plate 61.



CHARLTON WEIR, AVOCA RIVER, VIC.

Plate 62.

MARQUIS'S HILL IRRIGATION TRUST CHANNEL, VIC.



KOW SWAMP NATIONAL WORKS: MACORNA CHANNEL AND REGULATOR, VIC.

It was in connection with the above resolution dealing with the allotment for the non-navigating months that so much hostile criticism emanated from South Australia. The great advocate for South Australia's rights, viz., Mr. J. H. Gordon, the Attorney-General, stated, "that this was appalling in its injustice to South Australia," and insisted upon a larger proportion of the flow being given to that State for this period.

The first article of the Premiers' agreement is in accord with the report of the Inter-State Commission, with the exception that if, during the navigation period, the river at Morgan falls below 4 feet on the gauge, or is not sufficient to provide a volume of 337,000 cubic feet per minute at Morgan, the three States suffer a *pro rata* reduction, so as to bring the volumes within the total available. The effect of the agreement is, that while the upper States were allowed by the Commission to divert the full quantity stipulated until the river fell below 170,000 cubic feet per minute at the South Australian boundary, the Premiers' agreement provides for a reduction to the States when the discharge at Morgan is less than 337,000 cubic feet per minute.

Article No. 2 of the Premiers' agreement deals with the non-navigable period from February to June, and states that in normal years of low river discharge, the States of New South Wales and Victoria shall, during the five months February to June inclusive, limit their respective diversions from the River Murray and its tributaries to 190,000 cubic feet per minute on the part of New South Wales and 100,000 cubic feet per minute on the part of Victoria ; subject, however, to the condition that the volume flowing in the river channel at the eastern boundary of South Australia shall not be reduced below 150,000 cubic feet per minute. When the volume of available water is greater during the said period of five months than would be required to provide 190,000 cubic feet per minute at the offtakes in New South Wales, and 100,000 cubic feet per minute at the offtakes in Victoria, and to leave a volume of

Plate 63.



A MURRAY RIVER STEAMER.

150,000 cubic feet per minute in the river at the eastern boundary of South Australia, the surplus may be appropriated by the three contracting States in the proportion of, ten-eightieths to New South Wales, five-eightieths to Victoria, and three-eightieths to South Australia. Whenever the volume available during the said period is insufficient to provide 190,000 cubic feet per minute at the offtakes in New South Wales and 100,000 cubic feet per minute at the offtakes in Victoria, and to leave a volume of 150,000 cubic feet per minute in the river at the eastern boundary of South Australia, a *pro rata* reduction shall be

made in the diversions by the upper riparian States, so as to leave 150,000 cubic feet per minute in the river at the eastern boundary of South Australia.

This is a concession to South Australia, as it provides for a continuous flow of 150,000 cubic feet per minute at the South Australian border, whereas the Royal Commission allowed 70,000 cubic feet per minute, and, furthermore, stipulated that when the volume in the river was insufficient to provide for the irrigation requirements of the upper States, and at the same time to give a volume of 70,000 cubic feet per minute to South Australia, the three States suffered a *pro rata* reduction in the volumes allotted to them.

It will be remembered that the Press of New South Wales and Victoria attacked this portion of the agreement in very strong terms, as it was thought that if we were again faced with the condition of the abnormally low river of 1902, the interests of New South Wales and Victoria would suffer. The Premier of South Australia has now agreed to

**Modification
of the Premiers'
Agreement.**

Plate 64.



RIVER STEAMER AND BARGE, BARWON RIVER, AT WALGETT.

a very important modification of the agreement, and it provides that in the event of the river at the South Australian boundary falling below 150,000 cubic feet per minute the whole of the flow will not pass on to the southern State, but each State shall suffer a *pro rata* reduction, so as to bring their sum within the total available. New South Wales under the modification—which has been incorporated in a

Bill to be presented to the several Parliaments for ratification—would be entitled to nineteen forty-fourths, South Australia fifteen forty-fourths, and Victoria ten forty-fourths of the available flow.

As an example of the importance of the modification referred to, it may be pointed out that had the original agreement been in force during 1902–1903, there would have been seven months during which South Australia would have received the whole of the Murray flow, and while the volume was not sufficient to provide a navigable depth, the upper riparian States would not have been able to divert any water. The rivers of Australia, however, were lower during the period mentioned than any previous known record, and the volume passing down the South Australian river was not sufficient to provide for the evaporation of the lakes at the mouth.

The following tabular statement shows the apportionment under the original and modified agreement :—

TABLE showing apportionment of Murray Waters, supposing the provisions of the Premier's Original Agreement and the Modified Agreement respectively had been in force during the specified months of 1902 and 1903.

Year and Month.	Estimated flow at E. boundary of S. Australia from the Morgan gaugings, allowing for synchronisation, existing diversions, and losses in transit.	Apportionment under Original Agreement.			Apportionment under Modified Agreement.		
		New South Wales.	Victoria.	South Australia.	New South Wales.	Victoria.	South Australia.
All volumes expressed in cubic feet per minute.							
1902.							
March	123,000	Nil.	Nil.	123,000	53,000	28,000	42,000
April	89,000	Nil.	Nil.	89,000	38,000	20,000	31,000
May	89,000	Nil.	Nil.	89,000	38,000	20,000	31,000
June	100,000	Nil.	Nil.	100,000	43,000	23,000	34,000
1903.							
February ...	123,000	Nil.	Nil.	123,000	53,000	28,000	42,000
March	80,000	Nil.	Nil.	80,000	34,000	18,000	28,000
April	66,000	Nil.	Nil.	66,000	28,000	15,000	23,000

It has been asserted that the diversion of water has interfered with the navigability of the Murray and tributary streams, and the South Australian Government has been urged to appeal to the Privy Council. Such a question might, perhaps, be brought before the Privy Council as a question arising in the course of litigation between two or more States, and proceeding to the Privy Council with the consent of the High Court of Australia. Apart from litigation in this way, it may be questioned whether the power formerly exercised by the Crown of referring questions in dispute between

Has the diversion of the water interfered with the navigability of the Murray.

Dependencies to the Privy Council for its report still subsists in view of the judiciary clauses of the Federal Constitution. In the event of an appeal to the Privy Council by South Australia, it is extremely uncertain what the decision would be, and the possibilities of its being adverse to any particular State are such as to inspire caution and reluctance to enter upon a legal contest.

The words "reasonable use" in section 100 of the Federal Constitution will require very careful interpretation to conserve the **Reasonable use of water.** interests of each of the States.

Professor Pitt Cobbett interprets the word *reasonable* in the following terms:—"It consists of the balancing of the respective claims of navigation and of industry. If you could show that a particular industry of a very important kind could not be carried out without irrigation, and if the diversion of water would establish that industry, and there were other channels of communication, and if the navigation in this particular case were not of an important character, and the amount of trade carried not very large, or if the river were only navigable for certain portions of the year, I should say the use of an extensive quantity of water for the purpose of establishing an important industry would be a reasonable one, even though it interfered with navigation. On the other hand, if there were a large trade on a navigable river, and the diversion of water for the purpose of any trade or industry would interfere with the conduct of that important trade, and there were no other means of communication, I should say the diversion would be an unreasonable use of the water."

In the United States of America, it has been found necessary to modify considerably the earlier Common Law on the **Modification of Common Law on subject of riparian rights.** subject of riparian rights, and the user of flowing water, in order to meet the new conditions which have there sprung up, and which offer considerable analogy to our own. Mr. Alexander Oliver, President of the Land Appeal Court, Sydney, in the evidence that he gave before the Royal Commission on the Murray, stated: "That there is practically no body of riparian law in this or any other Australian State—that is to say, law that has been the result of the interpretations by the Judges. In our State, I think, we have only had one solitary case, *Lord v. the City of Sydney*. That was decided by our Supreme Court; it went to the Privy Council, and was there over-ruled. I have had one or two cases before my own Court, but in Courts of highest authority we have, as a matter of fact, a very small body of law; whereas in England and America there is a volume of law on the subject of riparian rights. There is no doubt that if cases had come before our State

Courts they would have been guided by the conditions of the drier parts of America than by anything European ; at all events more than by the conditions obtaining in Great Britain. ’

There are so many questions in doubt that an appeal to the legal tribunals by any of the States is for every reason to be avoided, and a settlement by agreement of the disputed points in connection with the allocation of the waters of the Murray and its tributaries is unquestionably preferable to an appeal to the law.

Settlement by
agreement
preferable to
appeal.

Plate 65.



BOATS LAID UP AT MORGAN, S.A.

Plate 65 is a view of the Murray at Morgan, in South Australia, showing boats laid up. One of the steamers at the wharf is “The Gem,” which is, I think, the largest boat on the Murray. She is fitted up with electric light, and has accommodation for a large number of passengers.

CONCLUSIONS.

The experience of Victoria, and the lessons that are to be learned from our cousins across the Murray in this great question of the utilisation of the waters, are such as to make one imagine, seeing that New South Wales has done so little, that we have not been fully alive to the necessity for developing the country and making it productive by applying water to the land. Unless a vigorous policy of water conservation be taken in hand, the arid and semi-arid portions of this State



MALMSBURY RESERVOIR, VIC.