



THE
WARREN WEIR AND DISTRIBUTION WORKS;
WITH
SOME NOTES ON THE EFFLUENT STREAMS OF THE
MACQUARIE RIVER.

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(I.) NOTES ON THE EFFLUENT STREAMS OF THE MACQUARIE RIVER.

IN order to clearly demonstrate the importance of the Weir and Distribution Works carried out near Warren, a somewhat lengthy description of the Macquarie delta and its watercourses is necessary.

Macquarie River—The Macquarie River rises on the western slope of the Great Dividing Range, and flows in a north-westerly direction until it enters the River Darling by various branches between Walgett and Bourke. The principal tributaries are the Turon, Cudgegong, Bell and Talbragar Rivers.

The catchment area may be divided into two portions, viz. :
(a) effective ; (b) non-effective.

(a) *Effective Catchment Area*.—This extends from the Darling Range to a few miles below Dubbo, and comprises an area of about 10,000 square miles, with an average annual rainfall of 28 inches. It is from this area that the river receives almost the whole of its water. The upper portion is rugged and has the greatest rainfall, but near Dubbo the hills cease, and the surface becomes a great alluvial plain.

(b) *Non-effective Catchment Area*. From this there is no run off except after phenomenal falls of rain. The area is about 6000 square miles, with an average rainfall of about 18 inches per annum. It consists of a more or less open plain, and forms an inland delta—probably the most typical of the many such formations on the inland rivers of Australia. The apex of the delta is a few miles above Narromine, and the base, on the Darling River, extends from 40 miles above Brewarrina to within a few miles of Bourke, a distance of nearly 100 miles.

Effluent Streams are thrown out from the Macquarie immediately after it embouches on to the plains.

Boggy Cowal.—The first of these is the Boggy Cowal, which leaves the left bank of the river a few miles above Narromine, and may be traced for many miles across the plains in the direction of Nyngan. River water enters this cowal only during very high floods. Several large and deep lagoons along its course, together with other evidence such as the existence of extensive beds of gravel, tend to prove that this channel was at one time the main bed of the river. There are

several such deserted main courses, and the present main channel is probably of recent date as such.

Cowal.—About 10 miles below Narromine, another cowl leaves the left bank and flows with a more or less defined channel in the direction of Trangie, where it crosses and recrosses the railway line. The author has been informed that from Trangie it runs in a more northerly direction, ultimately joining the Belaringar Creek.

Crooked Creek.—There are three watercourses in the district known as Crooked Creek, viz. :—No. 1, about 9 miles above Gin Gin Bridge, from the right bank to the Ewenmar Creek; No. 2 is to the west of the river commencing four miles below Warren; and No. 3, which leaves the right bank about 33 miles below Warren.

No channel is discernible at the point where Crooked Creek, No. 1, leaves the bank of the river, but at a short distance away there is a broad shallow channel rapidly deepening, until in the neighbourhood of the incomplete Gin Gin Weir it is about 300 feet wide and 25 feet deep. Below the junction with the Ewenmar Creek it is known by the latter name. The enlargement continues—principally in the depth—until at a few miles below the confluence the sectional area is considerably larger than that of the Macquarie at a corresponding distance. It is reported that the outlet from the river was still open when the first pioneers settled in the district, and that, at that time, a moderate fresh in the river sent a large body of water down the creek; but it subsequently became blocked by stranded *debris*, gravel, and silt, and has for the past 30 years been completely obliterated, so that now it is only during very high floods that water enters the creek at its former head.

As is the case with all streams flowing across alluvial plains, the banks of the river and its effluent channels are higher than the neighbouring country, owing to the fact that when the river overflows its banks the current is checked, and a portion of the suspended silt is deposited around grass, tussocks, and other vegetation, causing the formation of banks, which, along the Macquarie, are often as much as 5 feet higher than the neighbouring plains.

Below Gin Gin Bridge the weir channel becomes rapidly smaller, both in width and depth, and numerous breaks occur on both banks in the form of narrow and deep channels cut by the effluent flood waters. In most cases these rapidly shallow and widen out, so that all traces are soon lost, and the flood waters then spread across the less elevated portion of the plains until they are collected into a defined channel. Between Gin Gin and Warren, the escaping flood waters are collected on the left bank by the Belaringar and Gunningbar Creeks, and on the right bank by various small creeks which find their way into Ewenmar Creek. These breaks have largely increased both in size and number since the district has been settled; new ones are constantly forming, while some of the old ones become blocked by stranded floating *debris* and silt, a state of things due, in the author's opinion, to the closing of the inlet to the Ewenmar-Crooked Creek. About 12 miles above Warren, this creek has a larger cross section than the river at the equivalent distance, and has never been known, even in the most severe floods, to run more than two-thirds bank high. This reduction of the

available waterway of the Macquarie waters causes the early flooding which takes place from Gin Gin downwards. Before the construction of the Warren Weir Works, a fresh reading 23 feet on the Dubbo gauge was sufficient to cause the river to overflow at Warren, but sufficient water now escapes through the offtake cutting into the Burlong Creek to reduce the height of a similar fresh by 3 feet at Warren.

Below Warren, the Macquarie becomes narrower and shallower, until at about 40 miles it enters the Reed Beds. In both banks there are numerous breaks, the water from which unites to form the various effluent channels hereafter mentioned. About 5 miles below Warren, the Ewenmar Creek suddenly breaks up into a number of small channels which are soon lost on the plain. Portion of the flood waters finds its way into the Cowal Creek, the rest continues along the plain parallel to the river.

The Cowal Creek is 5 to 8 chains wide and 10 to 15 feet deep, with large waterholes at intervals; its banks are considerably higher than the surrounding country. Its course may be traced upwards to the right bank of the Ewenmar Creek, but the junction has been completely obliterated. The Cowal Creek bears evidence of having once been the main channel. Downwards the Cowal soon loses its defined character, and in many places it is but a string of waterholes at considerable intervals, connected by strips of swampy country. It has been traced until it joins the Marthaguy Creek (see diagram plan).

Crooked Creek, No. 3, leaves the right bank of the Macquarie about 33 miles from Warren. Its course, though narrow, is well defined and very tortuous; the outlet is at present blocked. It is fed by breaks from the river and by flood water from Cowal Creek, and flows for a considerable distance until it is eventually lost in the Reed Beds.

The Reed Beds are huge swamps which extend for a great distance in the direction of the Darling River; the effluent water is quite clear, all silt having been deposited. The fall per mile along the course of the Reed Beds is greater than that of the plains across which many of the inland rivers flow. The non-existence of a large defined channel is probably due to the main deltaic branch of the river having deserted its defined bed for a lower collateral plain, along which the water, on account of its dispersion, has not been able to cut a new channel.

Belaringar Creek is mainly supplied from breaks along the left bank between 10 and 23 miles above Warren. The water at first flows along swampy depressions on the plains until it reaches the wide deep creek channel. This creek unites with the Gunningbar Creek about 25 miles below Warren.

Gunningbar Creek is formed from the same breaks as the Belaringar Creek, and from several overflows near Warren. The head of this creek is 5 miles above Warren. It has a deep channel to a point 4 miles below Warren, where it suddenly bifurcates and re-bifurcates into a large number of gutters, none of which extend more than half-a-mile. It is remarkable how this creek, 80 feet wide and 25 feet deep, suddenly terminates without any apparent cause. This place is known as the

Overflow, and the creek is known locally as the Burlong, though classed in official documents as portion of the Gunningbar. In its natural condition the water at the Overflow divided, the greater portion flowing for 3 miles across a swampy plain until it reached the large, well-defined channel of the Lower Gunningbar. This creek again spreads out into swamps, through which it flows into the Bogan River. The rest of the water from the Overflow found its way into Crooked Creek, No. 2, and this water again divides, a portion overflowing to Duck Creek, and the rest continuing down the Crooked Creek and eventually joining the lower Marra Creek. Crooked Creek receives a large body of water in flood time directly from the river.

Duck Creek.—The water which overflows from Crooked Creek flows for 10 miles along a swampy plain before it reaches the defined channel of the Duck Creek. This creek is large and well defined, and runs into the Bogan River.

Marra Creek.—A very large body of water overflows in flood-time along the river frontage of Mumblebone and Butterbone holdings below Warren. The defined channel to this creek commences at the boundary between the above-mentioned holdings. The Milmirang Creek flows out of the Reed Beds into the Marra, which as a well-defined creek continues until it flows into an anabranch of the Darling River.

Besides these water-carrying creeks there are numerous deserted watercourses along which no water has ever been known to flow. In fact, the beds of some of these deserted channels are higher than the adjacent plains. The most notable of these channels is one which commences opposite the head of the Duck Creek, and continues between the Duck Creek and Bogan River on one side, and the Marra Creek on the other side, until it reaches the vicinity of the Darling River. These dry channels are clear proofs that the banks and beds are gradually built up by the alluvium which is carried down and deposited, until the water breaks away at some weak point and flows along the lower-lying plain. As soon as this takes place, the obliterating action of surface rain-water is unchecked, the banks are flattened down and washed into the bed of the creek, which is often silted up until it is higher than the adjacent plains. Crooked Creek No. 2 is just entering this phase.

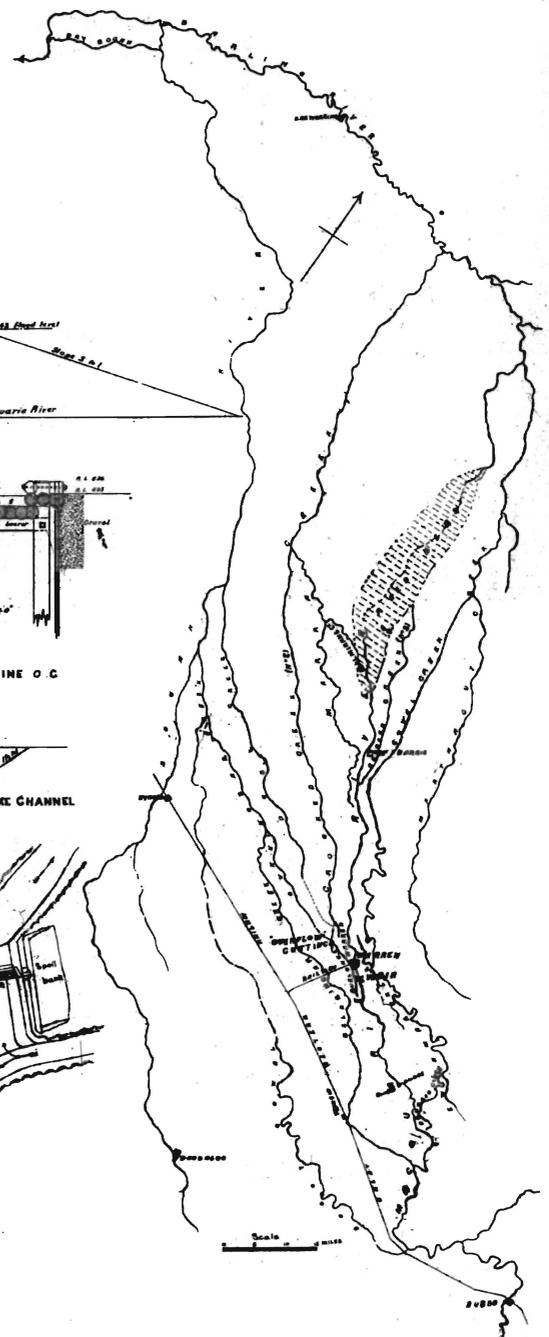
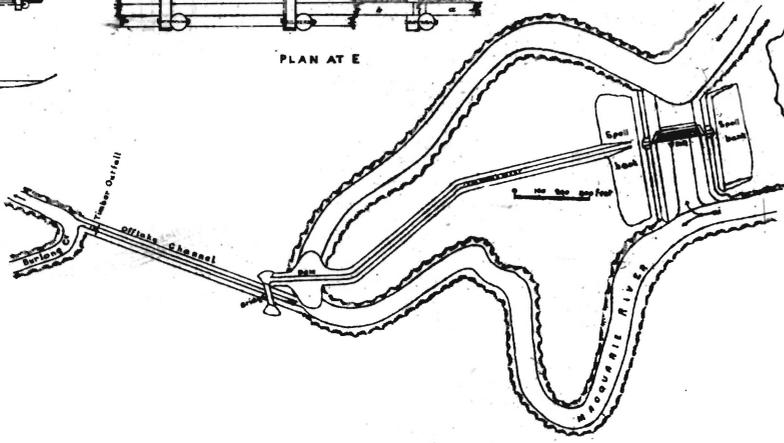
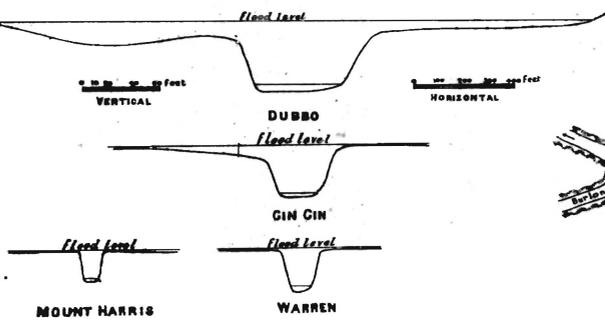
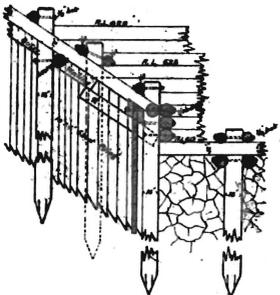
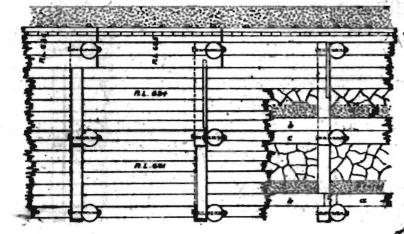
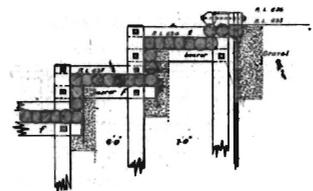
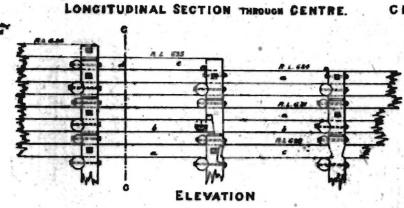
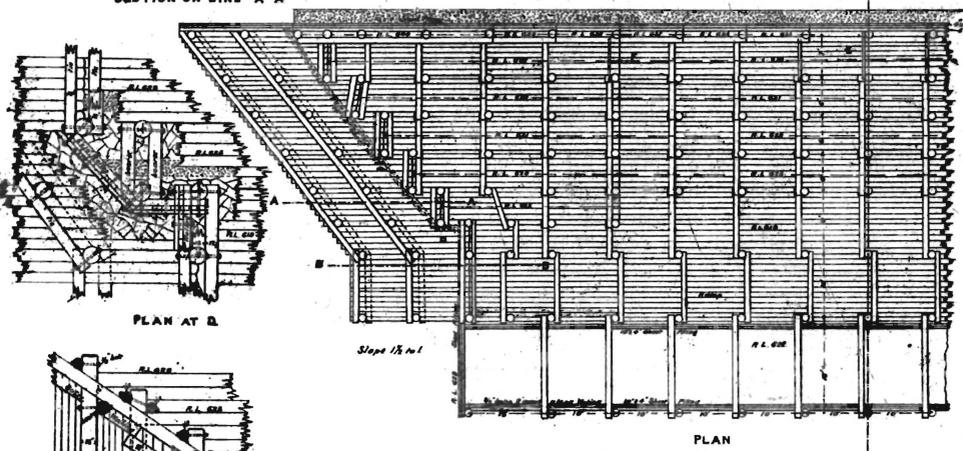
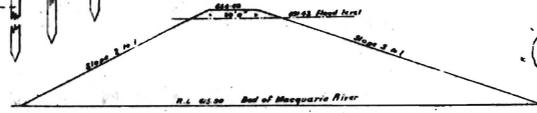
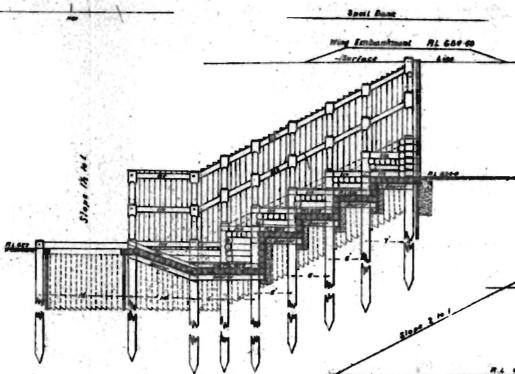
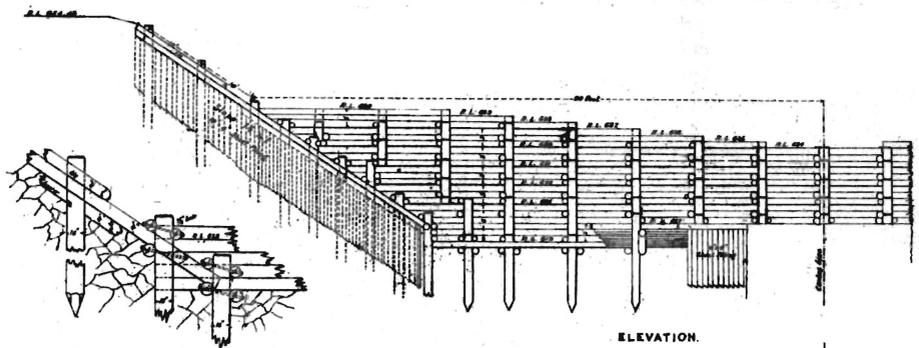
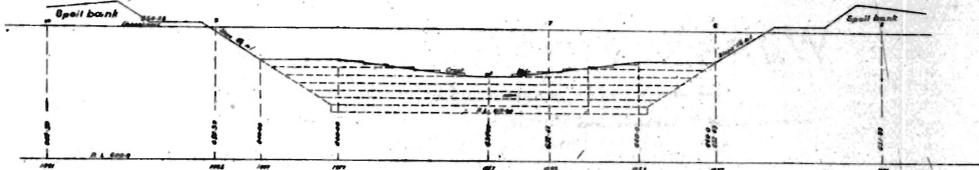
The general tendency of this complicated series of watercourses is to desert those to the east of the Macquarie, and to enlarge existing and cut new channels on the west or Bogan side of the river. If nature is not interfered with, there is no doubt that the main channel of the Lower Macquarie will eventually pass down the Gunningbar Creek, and thence down the Bogan River.

Seasons.—The Macquarie watershed suffers severely from floods and droughts. During the former, the country below Warren is covered by a tangle of flooded plains and creeks, whilst at other times, the river stops running and, with the exception of the very deep holes, the creeks dry up.

With rapidly increasing settlement, it became necessary to consider measures for water conservation, and for the better utilisation of the rivers, and it was early seen that this district offered very great advantage for experimental works. In 1885, Mr. G. H. McKinney, in

WARREN WEIR.

SCALES
GENERAL 1" = 100 Feet
DETAILS 1" = 10 Feet



Scale 1" = 1000 Feet