**CHAFFEY BROTHERS’ IRRIGATION WORKS BILL 1887**

**Legislative Assembly, 19 July 1887, pages 251-64**

Second reading

**The COMMISSIONER of CROWN LANDS (Hon. J. Coles),** in moving the second reading of this Bill, said that the Government did not take to themselves any credit for the scheme referred to in the Bill. He believed that the scheme was originated by the late Premier and matured by Mr. Howe, but the members of the present Government could claim to have been among the most ardent supporters from the first of the Chaffey project. (Hear, hear.) The subject was one that had been much discussed in public and private, and various persons had raised objections to the quantity of land and of water required. Others, again, objected on principle to the alienation of the land at all; and a third class raised obstacles to advancement in any shape or form whatever. As to the last class he need say nothing, but by way of introduction to an explanation of the provisions of the Bill, he would point out that up to the present time nothing in the way of irrigation had been done in the Australian colonies by the Government, and very little by private enterprise. About a year ago, in company with Mr. Handyside and Mr. J. C. F. Johnson, he visited the irrigation works at Echuca, and they there found that about £10,000 had been spent in irrigation works by Mr. Goldsbrough, and a considerable sum by Mr. Chrystal. It had been proved there and elsewhere that to ensure successful irrigation a scientific knowledge as to the mode of application of the water to vegetation must be acquired. That that knowledge might be secured for South Australia was the object of the agreement with Messrs Chaffey Brothers. (Hear, hear.) Passing to the Bill it would be seen that the preamble said— “Whereas it would be a great advantage to the province of South Australia to secure the application of private capital towards the construction of irrigation works and the establishment of a system of instruction in practical irrigation.” The schedule to the Bill set out the agreement, and the first two clauses of that agreement needed no comment. The third clause of the agreement described the land to be set apart. Clause 4 provided that the full value of any part of the 250,000 acres should be paid by Chaffey Brothers to the Government when and so soon as the Government became liable for the improvements on the existing leases. He ventured to say that it was a most satisfactory arrangement. Hon. members who followed the debates in the Victorian Parliament when Chaffey Brothers’ scheme was under consideration would remember that one of the objections raised to the scheme was that the Government at that time were altogether unaware of the amount they would have to pay as compensation to the lessees for the resumption of so much of their land as was necessary to enable Chaffey Brothers to carry out their proposals. The late Government had made a most advantageous arrangement with Robertson Brothers, the lessees of Bookmark station. Robertson Brothers had given up all right to any land that Chaffey Brothers might require for irrigation purposes, and the Government did not pay them anything for improvements, but as compensation granted them a renewal of a portion of their lease expiring in 1888 until 1895. Clause 5 gave the Government the right to proclaim travelling stock, water, and other reserves, and so the objection which had been urged that the Government would have to purchase land from Chaffey Brothers for these purposes did not hold good. In clause 7 it was provided that Chaffey Bros, during the first five years of the term should expend £35,000 on the land, during the second five years £140,000, during the third five years £75,000, and during the fourth five years £50,000, or in all £300,000. In clause 8 provision was made for the destruction of all vermin by Chaffey Brothers on the land taken by them, and in the next paragraph of the agreement the Government reserved the right to resume any land that might be required for the purposes of making railways, roads, tramways, or canals, while all minerals were also reserved, and there was a right to mine on private property. In fact going right through the agreement the Government seemed to have taken every precaution to protect the public interests . In the latter part of the paragraph it was provided that the Government were not bound to issue any grant for less than 500 acres, and the meaning of this portion of the clause he took to be, that although under this Bill 80,000 acres of land were set apart for the purpose of being immediately brought under irrigation by Chaffey Brothers as soon as Chaffey Brothers had supplied water to 500 acres, and had given the Government proof that they intended to proceed further with their agreement the Government had power to transfer to them that 500 acres of land. In paragraph 10 further precautions were taken. It had reference to licenses to take water under the authority of the Government. He knew some people outside the House were under the impression that the Government would be rendering themselves liable to an almost unknown sum in the event of its being proved that there was not sufficient water to carry out the various irrigation works started, and here he might say that he hoped Chaffey Brothers’ scheme would be the forerunner of many other such schemes. He thought before he sat down he would be able to show members from figures which had been most carefully prepared that there would not only be sufficient water for Chaffey Brothers’ scheme, but also for many other irrigation schemes on an equally large scale. Clause 11 of the agreement provided that in addition to the 30,000 acres of land on which Chaffey Brothers had to spend £4 per acre, the Government had power if they were satisfied that Chaffey Brothers were carrying out their agreement and intended to do so, in its entirety, to grant to them an additional 20,000 acres of land on the same terms on which the 30,000 acres had been granted. In other words, £4 per acre would have to be spent on 50.000 acres of land, and the Government had also the power to transfer to Chaffey Brothers 200,000 acres of land, provided that they spent £1 per acre upon it, and paid £1 per acre purchase-money. He happened to have a personal knowledge, extending over many years, of the country proposed to be dealt with, and he did not hesitate to repeat, the statement he had made in another place that if this land were offered to him to­morrow in its present condition for 5s. per acre he would be very sorry to take it, and if Chaffey Brothers as a result of their experience and money converted the land into something valuable, so much the better for them and South Australia. In clause 12 it was provided that all engines, machinery, and pieces of manufactured articles required to be used on the land by Chaffey Brothers were to be made in South Australia, and he was quite sure that the insertion of this clause in the agreement would be satisfactory to a large majority of members in the House. (Mr. Grayson—“ If it is carried out.”) So far as the present Government were concerned that clause would be most strictly carried out, and where engines or anything else could be made in the colony Chaffey Brothers would be asked to have them made here, and he was sure Chaffey Bros, would not object to carrying that portion of the agreement out. (The Hon. J. O. Bray —“ Hear, hear.”) Clause 13 set out that no large blocks of land were to be alienated. It provided in one case that blocks not larger than 80 acres were to be alienated, and in no case were the blocks to exceed 160 acres. There was considerable misunderstanding about the latter part of the clause, which was as follows “ And it shall be a further condition that in every sale, disposition, or transfer of such land by Messrs. Chaffey or any one claiming through them a sufficient water right, shall be secured to the purchaser, to be held with and run with such land as a perpetual easement.” He noticed in that morning’s *Register* an article dealing with the agreement, and while the criticisms of that paper on the subject had been very fair he thought this article might have been written perhaps under a misapprehension of what the facts really were. The writer said : - “ As we understand the agreement there is no provision made to protect the rights of those who may purchase any of the blocks from Messrs. Chaffey Brothers.’’ He ventured to think that the latter part of the clause did protect the rights of those who purchased the land from Chaffey Brothers. The writer continued:—“they will have their water rights sold to them with the land ; but what will be the use of that if they cannot obtain the use of the water ? In order to carry out the system of irrigation successfully expensive machinery will have to be maintained and worked, and unless it is clearly set out how the settlers are to secure the maintenance of those works there may be a great deal of trouble after the purchasers have taken possession of and begun to cultivate their blocks.” There was no doubt that a great deal of machinery would have to be made and set to work in order to pump a sufficient water supply on to this land, and it was only right that every precaution should be taken to ensure to those who purchased land from Chaffey Brothers that their rights in every respect would be protected. He purposed explaining exactly the course which would be adopted by the Chaffey Brothers and the course intended though not included in the agreement. It is as follows1. The Chaffey Brothers transfer to each purchaser the water-right to the purchased land which the Government transfer to them. 2. The Chaffey Brothers to erect pumps and construct the necessary channels and conduits to distribute water over the lands, which when complete will be handed over to a trust or corporation, in which trust each purchaser shall have shares in proportion to the number of acres purchased. 3. The trust or corporation shall maintain such works, taxing its shareholders for such purposes, but the trust is to pay no part of the original construction—this will be borne entirely by Chaffey Brothers. The purchase price of land includes the shares in the trust and the interest of a citizen in all public or semi-public improvements, such as the making of roads, the building of bridges, and which the public will maintain after their construction by the Chaffey Brothers. It must also be remembered that by clause 22 of the agreement Chaffey Brothers were bound to execute all necessary deeds and documents for the purpose of giving effect to the agreement. It would also be seen that Chaffey Brothers could at no time hold more than 5,000 acres of land. There were some who objected to this scheme on the ground that it was creating a land monopoly, but the House would see that Chaffey Brothers could not hold at any one time more than 5,000 acres, and hon. members might rest assured that the Government would take care that the agreement in that respect was carried out. Clause 18 provided for the endowment and erection of an agricultural college by Chaffey Brothers entirely at their own expense. In the next paragraph it was provided that if Chaffey Brothers did not carry out the agreement the Government had the power to resume possession of the land and improvements simply by paying 80 per cent of the cost to which Chaffey Brothers had been subjected. If the Government had reason to believe that Chaffey Brothers were not carrying out their agreement as they thought proper they could do one of two things— either give notice and insist on the agreement being carried out, or resume possession of the land and pay Chaffey Brothers 80 per cent, of the value of the improvements made. Clause 23 provided that in case Parliament should refuse to ratify the contract the late Government entered into with the Chaffey Brothers, Chaffey Brothers should be entitled to be paid by the Government a sum not exceeding £10,000 for substantial and permanent irrigation improvements that might have been made. (Mr. Ward—“ Have they made any *?)* So far they had done little or nothing. They had refrained from doing- anything until they knew whether Parliament intended to pass this Bill or not. He had not the slightest doubt, judging from the speeches made by hon. members, that the Bill would be passed, for he thought 19 out of every 20 members were in favor of the agreement entered into by the late Government. But as an earnest that they intended to do something Chaffey Brothers had purchased from Mr. Reed the steamer Jane Eliza at a cost of £2,000, and Mr. Reed had shown his belief in the ultimate success of the scheme by agreeing to take out the whole of the purchase-money in land and water supplied for irrigation purposes. Then an hon. member had asked him who was to value the improvements. That was provided for in clause 21 of the agreement, wherein it was set out that the matter should be referred to arbitration. The position of the Government with regard to the Chaffey Brothers’ scheme was this. They had already issued a license to the Chaffeys to take possession of the land to the extent of 30,000 acres, and on certain terms being fulfilled they had the right to issue to them a license for a further area of 20,000 acres on the same conditions as were involved in the first block. On the agreement so far being fulfilled the Government had the right to grant to the Chaffeys the fee-simple of an additional 200,000 acres, for which they are to pay £l per acre and on which they are to spend £1 per acre, so that the whole block would cost them £2 per acre. He now purposed giving some reasons why he asked the House to support the Bill. The first was that it would be the means of introducing into the colony a new industry in the shape of scientific cultivation by irrigation; secondly, it would be the means of settling a large population upon inis particular portion of the country; thirdly, it would prove of incalculable benefit to South Australians in having the Chaffey Brothers’ scheme carried out under our immediate observation ; and fourthly, it would lead to the introduction of capital, the encouragement of private enterprise, and the employment of labour. He thought every encouragement ought to be given to private enterprise, and the consequent employment of labor, especially as in this case the experiment was being carried on without any risk to the State. If the scheme were a failure the country would not lose anything, but if it were a success he ventured to say that the country would gain a great deal. He asked hon. members to look at the results of the Messrs. Chaffey’s’ experience in other parts of the world In California marvellous results had followed their irrigation undertakings. Land that formerly was valueless and without any population whatever was now covered with the most flourishing orchards, and a large number of people were settled upon it. He did not know whether he could do better in order to describe what had been done than quote Mr. Geo. Chaffey’s own words. He said :— “ Before we turned our attention to the land it was nothing but a sheep-run without a building. Now there are streets properly laid out with all the necessary buildings and a population of about 1,500. The selectors, who on an average do not hold more than 16 acres, are all doing well, and this last season 200 tons of raisins alone were procured. This is after three years.” He contended that the same result would follow here, because he believed that the climate of South Australia was most admirably adapted for irrigation purposes. Reason No. 2 had reference to the settlement of population, and here he would quote from one of a number of articles which appeared in the *Register*, and the writer of which appeared to have a considerable knowledge of the subject, and of the country to be dealt with. He wrote“ The tendency of the policy of irrigation is to concentrate population in particular localities for the purposes of mutual benefit. A space of territory 16 miles long by 15 broad, or 225 square miles in extent, would afford at an average of 32 irrigated acres for each family, room for no less than 4,500 families. Reducing this number to 3,000 so as to allow for the quantity of land that might not be available for irrigation within even the best selected area, it is still evident that a large population, say 10,000 or 15,000, could be gathered together in a comparatively small space. The aspect of such a settlement, with its fresh green meadow lands, luxuriant hedges and fruit trees, and high-standing crops, would be very different indeed from that of the majority of our parched-up agricultural areas. There is no doubt that in almost every part of the colony an immense improvement can be effected by the adoption of the practice of irrigation. But in the case of the land adjoining the River Murray, almost useless as it is at the present moment, the change would be the most obvious and perhaps the most marvellous ” Having an intimate knowledge of the country he could say that that picture was not one bit too highly painted, and he believed that the predictions as to the results of the Chaffey’s’ scheme would be fully realised. Then he came to reason No 3. namely, that incalculable benefit to be derived by the irrigation scheme being carried out under our immediate observation. He ventured to say that irrigation and water conservation would be two of the principal factors in the future of South Australia, and he held that the scientific application of water to the soil was necessary to bring this about. In this colony not only had thousands of pounds been spent but wasted on water conservation. In dam-making and well-sinking a great amount of money had been lost simply from a want of scientific knowledge as to the water being available or discoverable in any particular locality. The experience of the Water Conservation Department and the recommendations of the Government Geologist proved this In every case where the geologist had intimated that water would be found the trials had succeeded, and this showed how valuable and necessary scientific knowledge was in order to ensure success in regard to water conservation. And so it was in connection with irrigation. As some hon. members would know a certain quality of soil with a certain quantity of water will produce about four times as much as otherwise would be obtained, whilst another class of soil with the same quantity of water would be rendered unreproductive altogether. He had referred to the irrigation works of the late Mr. Goldsborough and Mr. Chrystal, near Echuca, and he could quote them as illustrations of this value of scientific knowledge. On Mr. Goldsbrough’s estate they spent something like £10,000 in pumping machinery and in cutting drains. When he and Messrs. Handyside and Johnson were there about two years ago it was admitted that 80-acre irrigation sections were a failure. It was found in dealing with such large blocks that the water saturated one portion, while another part got none at all, and they came to the conclusion that it was necessary to have level ground. After levelling the ground they found that there were so many different classes of soil that one equal application of water caused one portion to be productive and the other part to be quite the reverse They also found that, in order to ensure success, the land must be cut up into blocks of not more than 20 acres. This all went to prove how necessary it was to have the benefit of scientific experience. Now, he was very much struck with the words of the present Chief Secretary of Victoria in the address which he issued to the people in the Echuca district with reference to irrigation. It was well known that Mr. Deakin had taken a great interest in the question of irrigation for a considerable time past, and was appointed by the Victorian Government to proceed to California to report on the irrigation schemes there. That report was a most valuable one. In it he stated:—“ Irrigation only discloses its most marvellous capacities of production when—(1) It is studied as an art; and (2) when it is applied to intense culture. Unless carried on with the keenest observation and with the most careful judgment it will not yield anything approaching its best results. It offers the highest premium, not for quality of soil or quantity of water, but for intelligence, and this intelligence finds scope never in the growth of cereals, but always for vine, fruit, and alfalfa culture ” It appeared to him that we ought most certainly to embrace the opportunity which now presented itself of securing the means for teaching to the people of South Australia the scientific application of water. His last reason referred to the introduction of capital and the encouragement of private enterprise, together with the employment of labor. As to the expenditure of capital, he need only point out that the Chaffey’s were willing to spend £300,000, and that sum would necessarily mean the employment of a considerable amount of labor, and he had reason for saying that when the Bill was passed, at that very moment the Chaffey Bros, would be able to give employment to a large number or good men who, he was sorry to say, were walking about the streets. Besides, he believed if this scheme were authorised it would be the means of many other similar schemes being started. We only wanted, as it were, the object lesson to teach us how to utilise our natural advantages, and he could only say that he would only be too glad to grant other applications which might be made. It was now just as well that he should refer to some of the objections which he thought were likely to be raised. One which had already been raised by his colleague Mr. Glynn was with reference to drawing too much water from the river. He had taken special means to ascertain the quantity of water available in the river for irrigation purposes, and he might say that if the Government found that navigation would at all be interfered with they would be the last to ratify any agreement. (Hear, hear.) The figures showed that there was not only sufficient water for the Chaffey’s’ scheme, but for all other schemes that might be undertaken, and that still there would be ample water for navigation in ordinary seasons. (Mr. Rounsevell—“ We shall be pleased to know that.”) The quantity of water required for irrigating 30 000 acres, watered 18 inches deep, for a year would be 1,960 million cubic feet; for 50,000 acres, 18 inches deep, 3,267 million cubic feet; for 100,000 acres, 18 inches deep—the estimated extreme limit of land to be irrigated by Messrs. Chaffey—6,634 million cubic feet. That was the estimated quantity of water required, but he wished to impress on hon. members that in all probability Messrs. Chaffey will take little or no water from the river at all. By making a small dam in Ral Ral Creek they could store there and in the Lakes Woolpoolool and Merity a sufficient quantity of water for irrigating the land in ordinary seasons. (Hear, hear.) That being the case, the House would see at once that there is no danger of interfering with the navigation of the river. Irrigation would be carried on when the river is in flood, and then these lakes and creeks are filled. The water in them would be impounded and used for irrigation. The quantity of water discharged by the Murray at Morgan in 1884, a year of low river, was about 210,000 million cubic feet; in 1886, a year of high river, the quantity discharged at the same place was about 550,000 million cubic feet. Supposing, now, that every drop of water required for irrigation were taken direct from the river, and that not a drop were impounded in the lakes or creeks, the following statement showed what would be left:—To irrigate 30,000 acres required 1,960 million cubic feet of water, and after that was taken from the river there would remain 208,040 million cubic feet. Supposing 50,000 acres to be irrigated, 3,267 million cubic feet would be required, which would leave in the river 206,733 million cubic feet. To irrigate 100,000 acres, which was taken as the maximum amount of land which Messrs Chaffey would artificially water, 6,534 million cubic feet would be required, and this would leave in the river 203,466 million cubic feet. These calculations were for 1884, an exceptionally low year. In 1886, when 550,000 million cubic feet of water were discharged, the calculations were as follows. To irrigate 30,000 acres would leave in the river 548,040 million cubic feet ; to irrigate 50,000 acres would leave 546,833 million cubic feet; to irrigate 100,000 aores would leave 543,466 million cubic feet. These figures must for ever set at rest the question as to whether irrigation would leave a sufficient supply of water to serve the purpose of navigation. (Mr. Ward— “ Who prepared the statement?”) It was the work of an officer of the Water Conservation department. From an analysis of the chart of river levels it was found that, generally speaking, the level of the river throughout the year is about as follows:-Rising in July and August; high river in September, October, November, and December; falling in January and February ; low river in March, April, May. and June. The above applied generally over a series of years, the exceptional years being 1863.1870, 1875, and 1886, which were years of abnormally high river. The report of the Conservator of Water showed that when the water will be required for irrigation the river will be at its highest, and supposing every drop of water required for irrigation were taken from the river without attempting to impound a single drop the figures he had quoted showed that there is ample water for all other pur poses. It might also interest hon. members to know that the rainfall at Bookmark is about 11 inches per annum. (Mr. Rounsevell—“ That is not much good for irrigation.”) They had been told that the Government ought to carry out this scheme, but he altogether disagreed with the idea that the Government should be looked to for everything. He was very glad to see private enterprise step in. (dear, hear.) It was quite possible that the Government would carry out the scheme as successfully as any private individuals, but if the State administered the land one of the first things to happen would be petitions and deputations coming to the Commissioner of Crown Lands asking that the upset price should be reduced and all kinds of concessions granted. It would probably result in the whole scheme being a gigantic loss. (Hear, hear.) Mr. Glynn would doubtless object to the scheme from conscientious scruples as to the alienation of land on any terms, but he would point out that the grant of these 50,000 acres to Chaffey Brothers conditionally on their spending £200,000 upon them is a bonus. We granted bonuses in all directions for other purposes, and he thought Chaffey Bros.’ scheme was likely to prove one of the most successful things ever attempted here. At all events they ran the risk of it. (Mr. Krichauff— “At all event they have the experience.”) He was certain that shrewd men as they are they would not undertake a work of this kind unless they were perfectly certain themselves that the thing is going to be a success. If they could convert land which is not worth more than 5s. an acre into land worth £20 an acre, so much the better for them and for us, because where we now get practically nothing for it we should then be able to get something in the way of land tax. (Hear, hear.) Another objection that might be brought was that we are going to give too much of our irrigable land to these gentlemen, but those who urged that objection spoke from an imperfect knowledge of the quantity of land available for irrigation purposes. He could not give the exact quantity because he did not know it, but he knew that there is an immense area available for such purposes, and it would be satisfactory to the House to know that he had given instructions to the Surveyor-General to have a survey made of the whole of the land available for irrigation in the valley of the River Murray, on which similar concessions can be made to other people who may think it worth while to apply for them. The Chaffey Brothers’ scheme had been discussed on almost every political platform, and not only were the large majority of hon. members pledged to support it, but if South Australia were polled at least 990 out of every 1,000 people would be found to be in favor of it. (Hear, hear.)

Mr. GLVNN said he would give the reasons on which he founded his objections to the passing of the Bill. He must first differ from the Commissioner of Crown Lands as to this question having been discussed on every platform at the hustings, because as far as his knowledge went it had not been discussed on a single platform except that on which they both stood. The scheme had caused quite a chorus of jubilation all over the colony. In fact it became a parrot cry that the Chaffey Brothers’ scheme was all in all for the colony, and he did not know anyone but himself who had entered a protest against that cry. He had listened with great attention to the figures given by his colleague as to the quantity of water that would be required if the agreement was carried out, and he believed he was right in stating that the figures given to-day, although they expressed the result in different terms, did not differ materially from those on which the Conservator of Water based his report to the House in 1886. The Commissioner had stated that he did not remember the figures he gave on the hustings, but that they did not differ materially from those given in the report of 1885, and of course Mr. Jones having gone through his calculations carefully he could not differ from those he formerly gave to the Commissioner of Crown Lands. The quantity was now given as the total discharge for the year in cubic feet, whereas then it was expressed in so many feet discharge per second, and per 100 acres. However, he would take the result of the Conservator’s calculations, and he would also bring to bear the experience of India, Spain, and California, to show that his calculations are justified in the main. He had very little fear in saying that if the agreement with Chaffey Brothers is fully carried out under the terms before the House it would, taking other contemplated schemes into consideration, practically exhaust the volume of the river. There appeared to be now some wavering as to the acreage, and he saw the Commissioner said something about 100,000 acres being the contemplated maximum, whereas the agreement gave a right to 250,000 acres. (The Commissioner of Crown Lands—“ He can’t Irrigate all that.”) In all the press conversations with Messrs. Chaffey they did not appear to have a thought as to any difficulty in carrying out the irrigation of the whole lot. At any rate the Bill dealt with 250,000 acres, with that quantity he should deal, and he would endeavor to show the result of carrying out the scheme. He quite agreed with the desirability of encouraging private enterprise, but there were circumstances under which the Government was bound to suspend the standing orders of political economy, and let the State carry out certain undertakings where there was a danger of private persons getting a monopoly. According to the report of the Conservator of Water for 1885 it would require a continual flow of four cubic feet to irrigate 1,000 acres in the hundred of Morgan to the depth of 12 inches, and that was declared to be only for summer irrigation. The total flood discharge of the Murray was 800,000 cubic feet per minute, or 13,333 feet per second. But the flood discharge was only for six and a-half months of the year, and irrigation would also be required at other times. The total flood discharge would irrigate 3,333,250 acres to a depth of 12 inches, or 1,666,625 acres for 24 inches, or 1.111,082 acres for 36 inches. Take it another way. The Conservator of Water said it would take 1-3,000th of flood discharge to irrigate 1,000 acres 12 inches. Therefore the Murray on that basis would only irrigate 3,000,000 acres to that depth, or 1,500,000 acres to 24 inches, or 1,000,000 acres to 36 inches. He understood Chaffey Brothers proposed to give 18 inches. (The Com­missioner of Crown Lands—“My calculation is based on 18 inches.”) He thought they would require to give 24 inches. The French and Italian authorities showed that 24 inches would not be above the average. In California, according to the *Register,* the practice was to give three waterings of 12 inches each, or 36 inches annually. That might be an excessive quantity of water, but it was used. In Colorado one cubic foot was given to 53 acres, whilst in Pasadena, California, 1 foot was given to 1,165 acres, showing the different quantities considered necessary in different places and the difficulty of absolute accuracy as to average. Mr. Deakin said :—“ It would be idle to attempt more than a guess at what the duty of water would be in Victoria, but judging from the opinions of experienced canal proprietors in the west, even with rude methods, it should be possible after the first year or so to make a flow of one cubic foot per second at the field cover 200 acres of cereals, and 400 acres of vineyard or orchard.” Stewart in his recent work on irrigation said—“ In India one cubic foot per second is made to serve 200 acres of grain crops. In some parts of Spain this quantity serves for 240 acres; in others the same quantity is spread over 1,000 acres, and the legal allowance in some Spanish recent grants varies from 70 to 260 acres per cubic foot per second.” The same authority gave one-half cubic foot per second as an average for 100 acres, or one foot for 200 acres, or four feet for 800 acres. Mr. Jones gave about four feet for 1,000 acres, or say one foot for 238 acres. The Californian figures did not include soakage or evaporation, and were for long canal lengths. Here the loss would not be so great from those causes, the land being close to the Murray so that he did not proportionately incase his estimates. He had written to an engineer in the employ of the British Government in India, and had asked him certain questions categorically as to the quantity of water found necessary for irrigation. His correspondent, in reply, took the case of the Eastern Jumna Canal, and said that the irrigated area there was 130,651 acres, and the average water consumed (net) for the five years preceding 1885-6 736 cubic feet per second. This correspondent wrote“ But this average of 736 cubic feet does not show the consumption of water in dry periods or at special times, as when the wheat grain is rinsing ; thus, looking at my records, I find a steady 881 to 1,040 cubic feet per second used from 3rd to 18th December, 1883 ; again, February, 1884 for three days ; and from 881 cubic feet to 1,300 cubic feet per second from 12th March and right through April, 1884, the wheat and barley being cut in April. The main wheat demand is in December; later on than that much of the demand is for irrigation of sugarcane. It is about correct to say that in this part of India an irrigated area of 100,000 acres will consume at times quite 800 cubic feet of water per second in dry winters. Later on in the year this would increase to about 960 cubic feet per second for the same area under irrigation.” He would ask hon. members to look into these figures, and compare them with those of the Commissioner of Crown Lands. He could not say what the discharge of the Ganges Canal was, but he believed it was 8,000 cubic feet per second, and it only irrigated 1,045.013 acres. The rainfall was 28 inches. In the Italian canals the discharge was 24,000 cubic feet per second, irrigating 1,600,000 acres, equal to one cubic foot for 66 acres. The rainfall of the irrigated regions of Italy was from 37 to 88 inches per annum, and the temperature varied from 70 to 90 decrees. The last report of the Victorian Water Commission said :— “ A flow of 13,000 cubic feet per minute for five months would, after allowing 25 per cent, for loss and waste (the absorption and evaporation will be greater in summer than in winter), put a depth of 15 inches over 38,700 acres.” On the basis of which the flood discharge of the Murray, say 13,000 cubic feet per second, would irrigate 1,161,000 acres to a depth of 30 inches. On the basis of these calculations 250,000 acres to 24 inches would take 1-6th to 1-7th of the flood discharge of the Murray, and 500,000 acres would take double that quantity. Now, it must be remembered that this was to be an educational scheme, and that it was understood that if it were a success other schemes would follow. In Victoria there were 1,064,384 acres to be irrigated by the State itself on the recommendation of the Victorian Water Commission, and the commission said that up to four million acres could be irrigated. All this was to be done on the Murray and its tributaries. In some cases the water was to be impounded, but the impounding was to be done on the catchment area of the Murray. He said, therefore, that the scheme of Chaffey Brothers and that contemplated by the Victorian Government would practically almost completely exhaust the flood-water discharge of the Murray. There was also the tremendous loss of water by evaporation to be considered. Stewart wrote :—“As already stated by far the largest portion of the water which falls upon the earth’s surface is removed by evaporation. Observations made at Abbot’s Hill, England, by Mr. Dickenson, showed that 90 per cent, of the water which fell in summer, or between April 1 and October 1, was removed by evaporation, and only 10 per cent, found its way Into the drains, which were from three to four feet deep. The total quantity of water which fell in these six months was equal to 2,900,000 lb. per acre, and of this more than 2,600,000 evaporated. It should be remembered that this occurred in a most cool climate, the verdure of the meadows in which is hardly equalled in any other country unless it be the still more humid Ireland, the Emerald Isle.’” Another feature had to be taken into calculation, and that was the nature of the soil to be irrigated. Quoting from the same work he found:—“Mr. Gasparin, who stands at the head of numerous writers on this subject in that country (France) states that a soil which contains 20 per cent, of sand needs to be irrigated but once in 15 days, while under similar circumstances another soil which contains 80 per cent of sand should be irrigated once in five days”. He believed the land to be irrigated at Bookmark contained a very large percentage of sand; the greater percentage being sand and the balance clay, the water required would be the maximum allowance. Then not only would the quality of the soil require a very large quantity of water, but the rainfall was slight, and the evaporation in the thirsty climate of 8outh Australia would be practically at its maximum also. So much for authorities, and he would now like to say something on the subject of damming. The Commissioner of Crown Lands said the Chaffey Brothers could easily dam up the water required in the Ral Ral Creek. From what the Conservator of Water had told him the creek would be only able to hold two months’ allowance of a depth of 18 inches for 30,000 acres. This would only give one month’s supply to 60,000 acres, one fortnight’s supply to 120,000 acres, and seven days’ supply to 240,000 acres. He thought members would therefore find that this creek would not be able to supply 250,000 acres to the extent of 18 inches for a longer term than 12 or 13 days, and he might say with regard to floods, that floods could not be impounded. It had been said that there were heavy floods at certain periods and that these could be impounded ; but while they could impound flood waters, this could not be done with floods, experience in connection with the strengthening of Indian reservoirs having shown that the floods came down with enormous impetuosity and swept away everything that affected their career. He thought if this matter were referred back to the Conservator of Water, and he were asked to give a lucid statement of the water required to irrigate 250,000 acres to a depth of 18 inches, and to give his estimate of the discharge of cubic feet per second, he thought it would bear out what he had said as to the capacity of the Murray and as to its maximum discharge. His contention was that if they conferred on Chaffey Brothers the right to receive water to irrigate 250,000 acres, and took into consideration the amount of water used above stream, they practically conferred upon Chaffey Brothers control over the effective volume of the Murray. The balance of water that would be left would not be sufficient to carry on navigation on the Murray River in South Australia. In several months of the year, while pumping was being done, under present circumstances steamers could not go up the river with cargoes, and if they reduced the level of the Murray they would put a stop to navigation altogether during the irrigating season. He said that we ought not to confer on private individuals by this agreement a monopoly of water rights on the Murray. Before this agreement was entered into it would have been better for all the colonies to have met together to have defined their mutual rights and come to some arrangement with Chaffey Brothers with regard to the quantity of water they were to consume. That arrangement should have contained some variable terms, for this reason. In the beginning the water duty would be very high. Supposing one cubic foot per second for 80 acres at the outset, then after a time when the capacity of the reception of the land would be less that duty might be raised to perhaps 160 acres, and then eventually to more. If then they entered into an arrangement giving water rights to private individuals they ought to arrange that the quantity of water allowed would be subject to revision at stated times. He was a strong advocate for the Government carrying out the scheme. (The Commissioner of Crown Lands— “There would still be the water difficulty.”) He knew that, but if it was to be a choice between navigation and irrigation let the State have all the accruing effects from the alternative of irrigation. He conscientiously believed that the Government could carry out this scheme, perhaps not so effectively as private enterprise — (hear, hear) — but still they would e able to do it. He would point out that after all Chaffey Brothers could not teach us very much, because, although they had done a great deal in the way of irrigation in America, they had not had any experience of the climate and soil in South Australia. If it were necessary to have a scientific teacher he had no doubt that we could get good men from California who would give instruction for £2,000 or £3,000 a year. He doubted very much whether under this agreement it was really competent for the State to give these powers to the Chaffey Brothers. He had been dealing with the question that the State had a right to give all the water rights to Chaffey Brothers necessary to carry out the agreement. He did not think there was such a right, and he thought the draughtsman of the agreement contemplated that point, (or he said, “ as far as they are able to do so.” The River Murray, for the purpose of reserving riparian rights, was not according to international law, although it was in fact, navigable. It was not a river through its course affected by the tide of the sea, and consequently a grant of land on the Murray carried with it a grant of the soil on which the water is right into the middle of the stream. If this agreement were carried out, and pumping took place to such an extent that the supply of private owners of property is affected. Chaffey Brothers would find themselves involved in many legal difficulties. If this matter of irrigation were taken in hand by the State the State should introduce a Bill similar to the one introduced he believed in California quieting riparian claims. In fact the State should be absolved from such claims. This work of irrigation could be done by the State itself. He might mention that he had brought this question under the attention of the gentleman from whom he had already quoted, not stating what his attitude was with regard to the Chaffey Brothers’ scheme, but asking him categorical questions ap to the possibility of this work being done by the Government. One of the questions was as to whether we could get men from India to carry out this work. The reply he received was as follows “ You ask if engineers could be got from Indian canals to work up irrigation in South Australia. Some could be got of course ; I myself hope to be at work in Australia some day, but the difficulty lies in terms. For a popular Government is far less attacked for giving away national property worth very large sums than it would be if it paid a competent man a competent salary for looking after that property and keeping its profits in the national purse.” In Madras a number of irrigation works had been carried out, and the only two in India which were disastrous failures were those undertaken by private individuals, and the Government had to resume the land and take the works in hand. Shortly after he had spoken on this subject in Kapunda a letter appeared in the *Kapunda Herald* from a gentleman who professed to be a correspondent to one of the Indian journals, and he said that the only two schemes of irrigation undertaken in India by private individuals were failures. (The Commissioner of Crown Lands—“That was a resident of Kapunda.”) No, it was not so. for the gentleman, he had discovered, was an engineer who had been employed by the very individuals who failed in these irrigation works. That gentleman remarked that if Messrs. Chaffey Brothers went to India the terms of the agreement they had made would be regularly laughed at. In Madras in 1875-6 the outlay on ten Canverl Canal was £133,964, and the profit, including land increase, was 81.30 per cent.; the outlay on ten canals was £1,881,241, and the profit, including land increase, was 12.18 per cent. Up to 1878 the outlay on the Scinde Canal was £667,704, and the profit, including land increase, was 19.66 per cent. He would again quote from Stewart, whose work was published in 1886. He said “In favor of Government control there is both reason and precedent. By no other authority could the conflicting interests of miners, agriculturists, and owners of land to be injured or benefited by the enterprise, be properly reconciled.” Again he goes on “ Lest, however, it might be urged that Government ownership and supervision is likely to lead to failure, the actual results attained in India may be very properly cited. During recent years the British Government has spent about 70,000,000 dollars (about 17.5 millions sterling), in irri­gating works, and others are in progress of construction which will require half as much more to complete them. In almost every instance the investments have been profitable, and in some cases enormously so, both in the way of water rent and in service to the cultivators of the soil. The total annual revenue to the Government from the works is more than 5,000,000 dollars, or 7 3/4 per cent, on the cost. In one case only has there been a loss. The capital expended in the largest works, and the annual revenue from them, is given in the following table, which is derived from the reports of the East Indian Government -“ North-Western provinces annual revenue, 5 1/4 per cent.; Punjaub, 6 per cent. ; Madras, 22 3/4 per cent.; Bombay and Sind, 12 per cent.; Ganges Canal, 4 1/2 per cent. ; Eastern Jumna Canal, 11 1/4 per cent. ; Western Jumna Canal, 7 1/2 per cent. ; Gaudavery Delta Works, 39 3/4 per cent.; Kistnah, 13 1/4 per cent. ; Canvery, 36 1/2 per cent. ; Sind Inundation Canal, 18 1/2 per cent.” And further on he continues“ Economy in the use of water, and in the construction of the works also, calls for such extended surveys, perhaps over hundreds of miles of territory, that no private persons nor associated companies could possibly perform them unless they were endowed with legalised monopolies or exclusive rights ; and in the light of past experience with huge chartered corporations, farmers could not wisely submit to have their interests—so vital in this case—placed in such keeping. The experience already gathered in the case of the Cavour canal in Italy proves that a chartered company is a most unsafe trustee for the interests of the persons most nearly concerned in an irrigating canal. In that case, while fortunes were made by speculators, the work was a failure, and the Government was forced to interfere and purchase the canal in the end.” He contended that the Government would have to do the same here, because the other parties would be cute enough to finish up the work as soon as the last acre was sold, and retire from the whole affair. It was all very well to say that the purchasers of the land would have the whole thing under their control as a sort of corporation, but the difficulties of their carrying on would be very great indeed. At all events all the evils incidental to analogous Government undertakings would be present, and he was sure that such a system applied to an irrigation colony containing such an immense population as was spoken of would lead to complete failure and no end of trouble. Now he would just like to revert briefly to the Indian engineer’s report, in which he said—“ Reverting to the Government works in India, there has been a great activity in canals in the last few years, and the capital sunk has been greatly increased since 1878. Thus in the north-western provinces it has risen to nearly 7 ½ millions, the old interest charges are wiped out, and we now show a surplus of £91,000 after deducting all interest charges. The net profit to the State on the canals in these provinces has varied from 4.45 per cent, minimum to a maximum of 8.57 per cent, on the capital invested, but much of this capital is in completely developed or even new canals which are barely paying their way. And no account is taken of rent rises.” In the return of profits upon water duties given no account was taken of the increase in land values; but leaving this out the figures were for the two old companies:—“East Jumna Canal, 20.14 to 20.46 in the last five years; Upper Ganges Canal, 5.54 to 8.45 in the last five years.” It might be said that the conditions were different in India, and in fact labor there was much cheaper, so that a given outlay in that country would cover a larger irrigated area than here. Of course he recognised that point, and he put it as one of his questions to his friend in India, who had answered as follows:—“ The difference in rates for the same kind of work is about as one to five taken all round so far as I know your rates. But looking at the different system of bridging, &c., which the difference of rates would lead you to adopt, I should say your canals would cost but very little more per irrigated one than ours do, because we have to cross enormous mountain torrents and dam up great rivers with solid dams on foundations that are taken down to clay. On the other hand, your water rates would be much higher than ours. Ours in the N.WP. are ridiculous. They are (taking the rupee=18d.) generally as below, with slight local variations where the water is run on to the field by gravity, and the tenant is not obliged to lift it himself.” He gave the cost of irrigating different crops as follows:— Sugarcane and rice, 7s. 6d. per acre per year ; tobacco, opium, vegetables, gardens, orchards, 4s. 6d. per fast . . . ; all cereal crops, maize, peas, indigo, cotton, 3s. 4d. per acre per crop; pulses and other fibres, fodder, 2s per acre per crop Any difference in the cost of making the canals would be far more than made up for by the difference in irrigation charges.” So much for the labor part of the question; but he could take it further. This Indian report was supported a good deal by the report of Mr. Stuart Murray, who, in connection with 1,064,384 acres scheme, gives the average charges for 10 proposed Victorian schemes as 10 inches in winter at 6s. 4 ¼ d., and 15 inches in summer at 10s.s 10 ¾ d. per acre, or a total of 17s. 3d. per acre. These figures sustained the Indian authority, who said that the charges here would be greater than there. But he would like to point out that the outlay in India was very great, and money did not go so far there notwithstanding the economy in labor. The canal lengths were very considerable. The Eastern Jumna canal had 130 miles of main and 640 miles of distributaries, whilst the Ganges canal in 1883 had 445 miles of main with 3,428 miles of distributaries, and the lower Ganges canal had 556 miles of main with 1,991 miles of distributaries; but the conditions were altogether different to what they are in South Australia. Here the water was by the hands of the irrigators and a given amount of capital would go further than in India or California. So much for the preliminaries of the agreement; now be would like to refer to the precise terms. His contention, he might first say, was that the water rights ought to be reserved by the state, and in support of that he would quote from Mr. Deakin’s report “ The owner of the water really owns the land for it is useless without his supply. The quantity of available water, and not the area of the territory, defines its agricultural extent; consequently where capitalists have built canals to lands which they do not own, and have secured the water, they have really acquired the land too. They have the farmers absolutely at their mercy, and enjoy a monopoly of the most arbitrary kind.” Again he said :—“ The one lesson to be learned in this connection, then, is that in the introduction of irrigation into Victoria it will be necessary to provide against the separate ownership of land and water, except where the water may belong to the State or is sold under its regulations;” and the essence of his recommendation was given in the following:-It is essential that the state should exercise the supreme control of ownership over all rivers lakes, streams, and sources of water supply except springs arising upon private lands”. The Chaffeys might transfer their monopoly, but still the settlers to whom they transferred would be monopolists of the water with reference to irrigation schemes afterwards. Now he came to the profits likely to be realised by the Government if they retained the work in their own hands. First, the land would be increased in value owing to peculiar conditions, as shown by the experience in India, although it often took 30 years there for schemes to become profitable. Then let them see how the land revenue would be affected. In India in 1877-8 the land tax yielded an increase from irrigation of £156,369 ; in 1878-9, £1.26.934 ; in 1879-80, £710,000; and in 1880-1, 763,000. And as regarded the profits, he would quote from Mr. R. Hanna, late of Colorado and Kansas, who, in his report on irrigation of Loddon and Gunbower districts, says “ In some parts of the Western states land, with the water rights attached, has gone up from 6s. Government valuation to £50. In California land has gone very much higher, the climate no doubt being the chief cause ; £200 has recently been paid per acre, including water and improvements. The climate of California is very similar to these colonies; what has been done there ought to be possible here.” On this point he would even bring the evidence of the Chaffey Brothers themselves. In connection with their Ontario colony at Los Angeles in a few years they spent £34,000 on it, and within three years sold 1,500 acres in 10 and 20 acre blocks at from £30 to £40 an acre, and about 120 town lots of quarter acre each at £20 a lot. They also, he believed, got land in Bernardino country at 90 cents, and sold it up to £100 an acre. That was on the Los Angeles scheme, within three years, about 69 per cent. on their money. That showed now extremely profitable these undertakings were, and how highly desirous it was that the State should carry them out itself. He would quote again from the report from India— “The real profit from a canal is got by those who own the land ; for while no government or company would be allowed to run water prices up to competition or famine price, the sum of the action of landowners has the effect of raising the rents to the most which can be got, which often is quadruple and quintuple what they were before the canal was made. This is not only due to the direct increase of productive power created by irrigation, but also to the increase of population attracted thereby, and to, most of all I think, the decrease of risk in ail agricultural operations. It is within my own knowledge that in parts of the Etawab and Cawnpore districts, where hitherto no canal irrigation had been done, but where there were old established canals in close proximity, the rentals of many favorably situated farms rose from 10d. per bigale (previous rent) to Is. 8d. per bigale and more (or from 2s. per acre before irrigation to 5s. per acre and up to 7s.) within one year of the Bhoginpour branch canal being opened. This was opened by myself in 1880.” He did not see why the Government should be less able to carry the scheme out than private individuals. It had been done in India, and in Italy in a small way, and it was contemplated in Victoria. Even if they discounted the thing by estimating the loss caused by the Government undertaking the work at 30 per cent, there would still be an enormous profit to the Government. He would now come to the agreement and endeavor to show what will be the profit of Chaffey Brothers, and what might be the profit of the Government. The cost of 50,000 acres at £4 per acre would amount to £200,000; then they had the preemptive right to 200,000 acres at £2 an acre= £400,000. He would also add interest at 2 ½ per cent, on the instalments of money as expended by them, which would not be in a lump sum. This would be £32,500, which brought the total of what Messrs. Chaffey would pay to £632,500. From the total acreage of 250,000 he must deduct 12,500 which would go as an endowment to the Commissioner of Crown Lands, and they got the balance available for sale, 237,500 acres. They could sell that land according to their own statements and according to foreign experience at £20 an acre, which would bring in a total oi £4,750,000. If they deducted from that the total cost, they would get a balance of £4,117,500 as the net profit of Messrs. Chaffey in this scheme. (Laughter, and the Treasurer- “ They can’t irrigate half of it.”). The agreement contemplated the irrigation of 250,000 acres; and Chaffey Brothers had said they could do it. (The Commissioner of Crown Lands— “ They have only taken up 30,000 acres ”) As soon as they have irrigated that they could get 20,000 acres more. (The Commissioner of Crown Lands— “ If the Government approves ”) The Government was bound to approve if Chaffey Brothers complied with the agreement. (Hear, hear.) If they carried out the agreement — which they could do on the reasoning of the Government itself—they would make the profit he had named. (The Commissioner of Crown Lands— “ I hope they may, but I am afraid they won’t.”) If the outlay was diminished the profit would of course diminish proportionately, but the principle was still the same. If the Government undertook the work, the outlay to them—inclusive of £200,000 purchase money which they would not receive —would be £632,500. He would add £20,000 for engineer’s salary=£652,500. Let them deduct that from £4,760,000. the total proceeds at £20 per acre, and a balance of profit remained of £4,097,500. Let them take the lowest calculations, without including water charges—say the Government let the land at 3 per cent, on the total value (£4.750,000), and deduct from that 5 per cent, on the £632,500, the estimated expenditure, viz., deduct £31,625 from £142,250, and there would remain a net annual profit to the State of £110,875. That was supposing the Government did not keep up the supply of water, as Chaffey Brothers said they themselves did not intend to do. It was based simply on the idea that the Government charged lower than the average rent, but the land might be let at 6 per cent, on the outlay. Three per cent, would pay the Government for supplying the water and cover the depreciation in machinery, salaries, &c. This fact was borne out by the experience of Italy, where the rent charged for irrigated land was actually £6, and in Spain £5 per acre. Supposing they let the land at £2 per acre—(The Commissioner of Crown Lands—“ And get their rent.”) He believed there would be no difficulty in that if the Government exercised a proper degree of firmness. Supposing the land was let at £2 an acre, they would have £500,000 a year, less £31,635 interest at 5 per cent, on total capital outlay (£632,500), and £125,000 a year for the cost of pumping the water, which he set down at 10s. an acre. Deducting that £156,635 from the £500,000, there was left as profit revenue of the Government, £343,375. Coming now to the agreement itself, clause 10 entitled Chaffey Brothers to every drop of water necessary to carry out their scheme. He questioned that right on the ground of riparian ownership. Clause 12 maintained that all engines and machinery used in the work of irrigation must be manufactured in South Australia, but that bait would fit just as well into a State scheme. Clause 13, which sought to limit the amount of land which an individual can hold, would prove futile, as such legislation always does when once the State parts with its lands. In Gawler, Light, and Adelaide, for instance, over one-third of the land has passed out of the hands of cultivating freeholders and was let to tenants. Another clause dealt with the rights of settlers to perpetual easement of water in proportion to the land they have bought. That also was utterly useless, and he did not see how by an easement it was possible to force any man to pump water onto any land. The Commissioner of Crown Lands admitted that as soon as Chaffey Brothers had sold their land they would stop pumping, and practically make a present of the machinery, leaving others to carry out the work. In than case either the Government must do the pumping for the settlers under all the disadvantageous conditions referred to by the Commissioner, or a company would have to undertake the work, or the settlers would have to do it themselves. In the second-named case the water duties would encroach enormously on the profits of the growers, while if the work was undertaken by themselves it would cost 10s, or 12s. an acre at least annually The easement would have to be paid for, in addition to what they would pay Messrs. Chaffey, at about 10s. a year per acre. On that point the agreement did not conserve the interests of the settlers themselves. (Mr. Burgoyne—“Hear, hear.”) He would next consider the cost of the land to settlers under the scheme carried out by Chaffey Brothers and the scheme carried out by the Government. The former proposed to sell the land at £20 per acre with 5 per cent, interest on deferred payments. The first year the principal on say 20 acres would be £50, interest £20=£60; the second year the payment would be £40, interest £18=£58; third year, principal and interest, £56; fourth year, £54; fifth year, £52 ; sixth year, £50; seventh year, £48; eighth year, £46 ; ninth year, £44; tenth year, £42. Thus the total cost of 20 acres, without calculating the cost of water, would be £510. Under the scheme, as it might be carried out by the Governments, he took the rent at 3 per cent, on £4,750,000 = 11s. 3d. an acre, or £11 5s. a year. This would bring in to the State £110,875. Under Chaffey’s scheme the first payment would be £60: under a Government scheme it would be only £11 5s. Then if £1 2s. 6d. an acre was charged to cover all costs, pumping, &c., that would mean £2210s. rent a year, or a profit revenue to the State of £221,750 annually, or say at £2 an acre, in­cluding water charges reckoned at 10s. an acre, or £125,000, the total would be £40 a year rent bringing: in £343,375 net profit to the State. He would submit those figures to the consideration of the House as based on the experiences of other places. His next objection to the scheme was that there was no provision against the land monopoly that would arise from the amalgamation of areas. It might be said that the Government could protect themselves by taxation but to tax on the present assumed value would be only a tax on 5s. an acre. In fact, however, it would be practically impossible to distinguish between the improved and the unimproved value. Nor could the principle of confiscation of land value be justly applied after the tenants had paid £20 for it under this scheme. It would probably happen that he would be in the unenviable position of being in a minority of one, and he could not forget that the crowning strength of conviction came from coincidence of opinion. But there was a wide difference between sticking to an opinion drawn from opposite arguments and the dogged maintenance of a position which had been assumed without thought. Nor was it quite clear that the popular verdict in this case can be called a verdict at all in the sense of being a conclusion deduced from a consideration of contrary evidence on a true issue. It appeared to have been assumed that the alternative to the acceptance of the scheme of Chaffey Brothers was to leave the land at Bookmark as wild as Nature made it, while the fertilising waters of the Murray ran waste to the sea, but that was not the true position. The Government could do all that was wanted far better than any American speculator. He did not mean under the Public Works Department. Unfortunately the genius of mismanagement seemed sometimes to preside over our great departments of State, in consequence chiefly of the fact that they often in more senses than one lost their heads. (Laughter.) Shakespeare tells us that the sense of death is most in apprehension, and we could not expect much sober guidance even from the ablest of heads while they suffer from the continued nervous anticipation of the sword of the political executioner. But a good deal might be done by boards. In Victoria the Railway Board had proved very successful. ( An hon. member—“ No *”)* At any rate it had increased the profits of the railway. It was surely a pitiful reflection on our enterprise and public spirit that we must import Americans to teach us what the Hindoos had done for ages, and to exchange for the sake of the lesson the only means of turning it to advantage. We would do more honor to our race by a nobler estimate of our powers. To think meanly of one’s capacities is not the way to accomplish great things. If this meanness of self-depreciation had been characteristic of the old stock of our descent, to vary a happy saying, the morning drumbeat of old England would not now circle the world. With the diffidence becoming in an humble dissentient from the great consensus of opposed opinion, but with the confidence of one who believed his case to be stronger than its advocacy, he must protest against this Bill. He protested against the Bill because it meant the hasty ratification of an agreement which has as yet received no consideration, but as one-sided as its merits, and such as no private individuals or company would ever have thought of entering into with Chaffey Brothers. He protested against it because it provided no means of protecting the water rights of the tenants after the last acre of land had been sold, and in this respect gave the Brothers Chaffey complete command of the situation. He protested against it because in respect of the possible interference with navigation in the full accomplishment of its purpose, it handed over to private individuals the compensating profits of a great public sacrifice, and, lastly, because believing with Jefferson that the land belonged in usufruct only to the living, and with the gospel that the fruits of the earth were for all, he recognised in Parliament—notwithstanding the force of vicious precedents to the contrary, and the imagined exigencies of a temporary depression—no moral right to barter away for a mere song 250,000 acres of the best situated land of the colony. (Cheers.)

On the motion of Mr. LANDSEER the debate was adjourned till Thursday next.

**CHAFFEY BROTHERS’ IRRIGATION WORKS BILL 1887**

**House of Assembly, 21 July 1887, pages 286-9**

Adjourned debate on second reading.

Mr. LANDSEER had taken an active interest in all matters connected with the River Murray for many years, and therefore felt that he would be justified in taking up a little time in discussing this Bill. While the Commissioner of Crown Lands had explained the measure clearly he had overlooked some important points. One was the question of riparian rights, for judging by the action of the sister colonies our position was threatened. Again, the Commissioner seemed to have overlooked the fact that water was movable, and had made up his figures as though it were stationary. It was only at certain seasons that the water flowed, and he asked how could the water be utilised when it ran away? If the hon. gentleman could impound the water his figures would have been correct. (The Commissioner of Crown Lands—“ I have thought it out.”) Then we had approached the other colonies in every way with a view to settling this question, but when we appointed a commission they disbanded theirs, and, indeed, they did not seem desirous of recognising our rights at all. He had never listened to a better speech than that delivered by Mr. Glynn, who had exhibited great care in working out his conclusions. (Mr. Krichauff—“But they were erroneous.”) Well, he had looked into them, and he considered that they were fairly correct. Certainly Mr. Glynn had overlooked the fact that the question of labor was a very important one. It was one thing to lift water and another thing to distribute it, and that was where cheap labor came in. Therefore he did not think his conclusions as to the probable profits were correct. Since the subject of irrigation had been mooted it had spread with great rapidity, and several schemes were proposed, and there was no knowing how many schemes might not be undertaken until they found that so much water would be absorbed that navigation would be completely stopped. In 1884, when there were no floods, the amount of water passing Morgan was only 6,000 cubic feet per second, and the result that year was that the seawater asserted itself as high up as Wellington, and to a slight degree as far as Murray Bridge. Now, if in addition there had been two or three large irrigation schemes drawing off water at the same time what would have been the result? Nothing in the shape of large irrigation works could be carried out without the application of a very large quantity of water; and if such a contingency as he had referred to were to take place, or if the supply of water were lessened in other directions, the claims for compensation which would be made upon the State would be alarmingly great. The Water Commission should see that the interests of the pioneers on the Murray were properly protected before we took action which amounted to an interference with riparian rights. With regard to the Messrs. Chaffey, he believed we could not have met with more earnest or gentlemanly men. We could not have been more fortunate in our selection of gentlemen to carry out this undertaking had the selection rested with us. Mr. Allan McFarlane. an old resident on the River Murray, had gone to great expense in the matter of irrigation—carrying the water five miles back from the river—and if his supply were interfered with the consequences would be very serious. But this class of people should be protected. He was told that the engineering difficulties could be surmounted so far as the salt water was concerned, but with the low-season flow the water was not adequate to supply the demands irrespective of the requirements of any irrigation works above. If the water were allowed to become brackish all the country in the vicinity of the lakes would lose its value, and thus he wished to point out the danger there was that in establishing a new industry the older industries might be destroyed. He asked the Commissioner of Crown Lands whether he had considered the serious results which might follow the passage of this Bill and he called upon the Water Commission to see that riparian rights were duly protected. If this were not done the taxpayers of the colony would be involved in very heavy expense.

Mr. KKICHAUFF said the questions raised by Mr. Landseer seemed rather difficult to meet, but he would point out to the hon. member that the water of the Murray up to the Murray Bridge was not always good sweet water ; on the contrary the sea water mixed with the water of the Murray, and rendered it brackish during certain periods of the year. Now, he had looked into the figures quoted by Mr. Glynn, and had found that they were not correct, and he hoped to be able to refute them. It was his firm opinion that South Australia would only keep pace with other parts of the world and recover from the present depression by a system of water conservation and irrigation. Unfortunately the Water Conservation Act of 1886 had not been availed of, and he was sure that not before we had a colony of irrigationists would this be done, as those people living away from the River Murray would not very likely under present circumstances avail themselves of the operation of the measure. It was too difficult to store water in reservoirs, and boring was still more difficult, because we had not a geological survey by which it could be ascertained where water could certainly be found. He hoped the necessity would be recognised of the early establishment of a colony of irrigationists on the Murray. He had years ago moved in that direction in the House, but there was a difficulty about the height of the banks at Morgan. He regretted, however, that the scheme had not been tried at some such place as was now found for Chaffey Brothers. Last year the House was envious of Victoria when they got an offer to form an irrigation settlement for Chaffey Brothers. Were we to refuse a similar offer when we actually got it ? (Hear, hear ) In March, 1883, the *Register* suggested that a bonus should be given to such companies as would first carry out a system of irrigation, but the *Register* seemed to some extent to have changed its mind now that it was proposed to give land of which we had plenty instead of cash, of which we had little. Mr. Glynn had spoken of “ the dogged maintenance of a position assumed without thought ” on the part of the House, but did that fairly apply to the Commissioner of Public Works or the Treasurer or Mr. Hawker, or himself, or others who had carefully investigated the subject for years? (Hear, hear.) Mr. Glynn had made his deductions from wrong premises. He spoke of the exhaustion of the water of the river by the irrigation of 250.000 acres, but it was doubtful whether more than 100,000 acres would be irrigated. (The Commissioner of Crown Lands— “That is quite the maximum.”) As to the quantity of water required, he doubted whether even 18 inches would be absolutely necessary. In India higher figures were quoted, but the evaporation from the standing reservoirs was enormous. (Hear, hear.) Mr. Culcheth, at page 16 of his second report, said that he expected better results would be obtained in the southern parts of Australia by irrigation than had been obtained in India from storage reservoirs. He added, “The milder climate and the prospect of water not being required as frequently support this view.” Mr. Culcheth, in another lecture delivered in April, 1886, said, referring to results obtained in India—“On one occasion I found that only 4,200 cubic feet of water per acre was used for one watering, or a depth of about 1 1/6 inches. This was after the ground had been watered several times, and the crops were nearly ready to cut. At first more than half as much again was given. The average quantity used during the season was nearly 30,000 cubic feet per acre, or a depth of 8 1/6 inches. The water had a very short distance to flow to the fields, and there was practically no loss between the point of measurement and the crops.” In South Australia if we should use a little more water than the Commissioner of Crown Lands expected at Bookmark it would not affect the navigation of the Murray. He felt certain, too, that after a time a considerable proportion of the water used would gradually find its way back to the natural reservoir or the river. (Hear, hear ) As to Italian irrigation works, and the quantity of water used there, it must be remembered that these works were for the growth of rice, where the plants almost literally floated in water. (Hear, hear.) The same quantity could not be required here, as Mr. Culcheuh had shown, and therefore to that extent the deductions founded by Mr. Glynn on the Italian figures were incorrect. An advantage of the project under the Bill was that the land was not yet alienated, so that there would be no difficulty about dealing with private owners. (Hear, hear.) Mr. Glynn seemed to think that the quality of the soil at Bookmark was such that an excessive quantity of water would be necessary, but Mr. Hanna, speaking of the character of the soil on the Murray, described it as being “ specially adapted for mixed agriculture,” and said that with “ the addition of from 8 to 10 inches of water it would grow almost anything the world would produce.” (Hear, hear.) He also spoke of it as one of the best blocks in the world for the economic application of water. Mr. Culcheth said also in his lecture that one good soaking would do an immense deal of good. It was a mistake to suppose that constant and continual flooding of the land was required. He highly approved of the spot selected. The Ral-Ral Creek being 20 miles in length, and in many instances 40 feet deep, it must certainly impound so much water that what Mr. Glynn said about its merely irrigating the land for 10 to 15 days was utterly wrong. He did not see that they were granting any monopoly in allowing Chaffey Brothers to sell land to others, as they were not to hold more than 5,000 acres themselves. Personally he thought it would be better to insist on their holding 6,000 acres, as they would then have a greater interest in the success of the undertaking. He thought, however, that there was not sufficient protection for the water rights of the purchasers of the land. Mr. Culcheth maintained that the landowners should be the proprietors of the irrigation works, while the action of the State should be limited mainly to providing legal facilities for carrying out the various schemes. It would be unwise to allow a permanent water right to those first using it, and the State must retain power to revise the conditions of supply, and, if requisite, to reduce the quantity. Mr. Culcheth continued—“ Returning to the suggestion made above, that a fair share of the available supply of water should be guaranteed for a certain number of years to those at once willing to undertake works, I would remark that if nothing is to be done till all who may claim to have a right to a portion of the water have agreed upon action, nothing will be done for a very long time indeed. Again, if no more water is to be taken than the share to which the area to be supplied would be entitled if all the land were supplied, there would be too little water to be of real use for any part. It is better that a commencement to utilise the water should be made on an unequal basis than that all the water should continue to run to waste till a perfect system can be agreed upon.” Riparian rights was a very difficult matter, and the sooner it was settled the better. He hoped the other colonies would give and take in the matter. Mr. Glynn thought the State should carry out the work of irrigation, but he affirmed that this would be a great mistake. (Hear, hear.) We did not expect the State to cultivate the land, nor did we expect it to irrigate. Mr Culcheth agreed in this, and further stated that sanguine expectations formed by the State in India and elsewhere had been of centimes sorely disappointed, so that what Mr. Glynn said about the great success of such Government works in India was not borne out by Mr. Culcheth, who had had a long experience in that country. That writer said—“ It takes a considerable time, depending on the conditions of the case, for any irrigation work to come into full operation, and in consequence few schemes pay for some years after their completion. When State assistance is given ultimate loss can only be averted by a proper system of administration, and then only provided the scheme is started on a sound basis, in accordance with the experience and results obtained in other countries, due allowance being made for the altered conditions.” We must have some one who had large experience and who at the same time was willing to take the risk of the enterprise. Mr Glynn said we might have got a man from California at a proper salary. Well, a good man had offered himself, but such a salary was proposed that he could not remain, and he had been secured by Victoria. Messrs. Chaffey said they had no doubt about being able to dispose of the products of the land, but after they had sold every acre he feared they might take very little interest in whether the produce raised could be satisfactorily disposed of or not. He would therefore encourage them to keep a share in the concern. In the future he believed most persons would be surprised at our hesitation in giving this grant, arising from our scanty knowledge of not only the advantages of irrigation, but of designing, constructing, and managing irrigation works of any magnitude, and the manner of cultivation by irrigation. We must purchase this experience from persons willing to risk their money, and therefore he hoped the preliminary agreement would be ratified by the House, (Hear, hear.)

Mr. COHEN was at one with the Government in their proposal to sell the Crown lands for the purpose of meeting the deficit, and he was also at one with them in regard to this Bill. There was one great drawback we had to contend against in this colony, and that was an insufficiency of rainfall, and if the Chaffey s showed us how to utilise the Murray waters and how to apply irrigation successfully they would confer incalculable benefit upon the whole community. In giving a small portion of our vast estate to these gentlemen it would be the means of turning an area unfitted for any other purpose into flourishing homesteads and thriving townships. He further believed that our farmers would gain very valuable knowledge from the Chaffeys, and they must not lose sight of the fact that in disposing of the land in this way we would obtain additional contributors to the revenue, which meant an increased income year after year. (The Commissioner of Crown Lands—“ Hear, hear ”) Again, we were from time to time lamenting the want of population, and here was a scheme which would bring people into the colony and give them something to do. He was a strong advocate of protection for the city, but he was even a stronger advocate of protection for the country, and he saw in this undertaking something that would assist the farmers materially. It was all very well to say that the Government should themselves initiate such schemes, but it was beyond the power of the Government to undertake such an experiment, and therefore it was better that men of knowledge and experience—(the Commissioner of Crown Lands— “ And capital”)—yes, and capital, should receive some concessions for carrying it out. He was quite convinced that if the scheme were a success the whole community would benefit as much as the Chaffeys would. (Hear, hear )

On the motion of Mr. CALDWELL the debate was adjourned until Tuesday next.

**CHAFFEY BROTHERS’ IRRIGATION WORKS BILL 1887**

**House of Assembly, 26 July 1887, pages 299- 306**

Adjourned debate on second reading.

Mr. CALDWELL congratulated the Commissioner of Crown Lands upon the very able and effective manner in which he had introduced this measure, and Mr. Glynn upon the very able and effective manner in which he had reviewed the proposals. Mr. Krichauff and Mr. Landseer had also favored the House with some shrewd and very valuable suggestions. Last session they had some very good speeches on the subject of water conservation, and judging by the zealous way in which members devoted themselves to the task of framing laws for conserving our water supplies and to give the people the advantages of those supplies, they had reason to expect much better results. But the whole thing had been disappointing, for the reason that the people were not educated up to the situation. As a consequence the Act had been abortive. With regard to the present scheme be had never considered it worthy of being magnified into the importance of a national undertaking, and for this reason during his electioneering campaign he had refrained from making any reference to it. Not that he did not wish to see people more permanently settled upon the soil than they had been during the past 10 or 15 years, but because he questioned the principle as contained in the agreement with the Chaffey Brothers. He had always looked upon it as a most objectionable form of special legislation, and which in this instance would be likely to lead to evils that they at present could not estimate. Whatever reproaches might be thrown at the Government they could not be charged with lacking the courage of their opinions, but a departure more bold, and the adoption of a principle more fraught with mischief, had never before been recommended by any South Australian Government. Indeed he had hoped that the Ministry would stay their hand, and give this matter further consideration. He had argued all along that our land laws were defective; the lines for settlement had been badly laid down, and as a consequence what settlement we had was not calculated to bring satisfaction to any right-thinking man. That substantial progress had been made under such conditions spoke well for the industry of the people. Take the settlement of the Murray Valley for example. Was it not a fact that applications for smaller blocks of land had been made (before the advent of the Chaffeys) by our own people for purposes of irrigation, and were they not refused ? About two years ago Mr. Patrick applied for 1,000 acres, and offered a rental of 3d. per acre in order to test the practicability of irrigation from the Murray, but the Government had thrown cold water upon his proposal. Now they were ready to give much greater facilities to these foreigners. If Mr. Patrick’s offer had been accepted the office would have been deluged with applications. He had frequently discouraged the forwarding of such applications, not because he did not believe in irrigation, but because he was aware that there was no law on the Statute-Book enabling the Commissioner to deal with the difficulty. As a matter of fact the tendency of our legislation had been in an opposite direction. Was it not true that the river frontage has been denied to our settlers almost all along the river ? All the legislation with reference to the frontage had resulted in inconvenience and dissatisfaction, and the frontages had only served as breeding grounds for vermin, and while he agreed that some alteration should be brought about he did not agree with the means now proposed. If the principle of the movement was right let the public have access to all the privileges. Let a general law be passed dealing with the Murray Valley and the Murray waters generally, and though desirous of seeing the community prosperous he could recognise no occasion for haste in this matter. The tide of population was not flowing in upon us at such a rate as to drive us to desperation. It was simply premature for them to play away the birthright of our children in what he considered to be a blindfold policy. He wished to see the whole question dealt with in a comprehensive manner, and as a national policy, but not in an underhand or special way. If this measure became law to-morrow, and any of our own people applied for similar privileges, they could not be granted without other special Acts being passed, and he thought that the Government should give them some assurance that a general measure would be in­troduced. He failed to see any emergency in this case. The world was not confined to the Chaffey Brothers, and he would ask whether the colony would be any the worse if they returned to Oanada tomorrow. (The Commissioner of Crown Lands- “ It will be better for the colony to keep them here.”) Parliament was the guardian of the public weal, and it was not for them to legislate in such a way as to impoverish our children by parting with their privileges. Special legislation had become the fashion, but he maintained that they ought to legislate on general principles. As hon. members knew a strip of country something like half a mile wide had been reserved along the river as a stock route, but it was seldom used for this purpose, and only produced vermin. Now, if the Government long ago had granted to our own settlers the privileges which they were going to give away to these foreigners the country would have been saved a great deal of money in the destruction of rabbits. (The Commissioner of Crown Lands—“The Chaffeys will have to kill them.”) If the Murray Valley had been settled it would have avoided considerable outlay, and he did not think our farmers could be accused of a want of pluck in their endeavors to open up our resources. (Mr. Castine— “Where is the harm in introducing fresh pluck?”) There would be no harm, but he wanted to see everyone placed upon the same footing Then there was another point. Hitherto the riparian difficulty had not given us much concern, but when we gave the right to irrigate 250,000 acres of land from the river the matter assumed a very different aspect, and until a clear understanding was arrived at between the various Governments we should hesitate to establish irrigation colonies along the Murray Valley. While he was favorable to water conservation and irrigation he thought the land laws of the colony should be re­spected. People had run away with the idea that the Chaffeys were of a charitable disposition and had come here for the purpose of conferring untold benefits upon the ignorant and uninitiated agriculturists, but when the thing was properly analysed it would be found that they had come here as American speculators, who saw grand advantages in connection with the Murray and were taking the best means for securing those advantages. He did not dispute that they would confer benefit upon the colony, but he did say that it was wrong to attempt to bring about good by bad means, and he held that the present proposal was a most illogical and unjustifiable departure from the land policy of the country. The House was indebted to Mr. Glynn for the way in which he had explained the evils that were likely to arise from such a course. Although he did not agree with the whole of the hon. gentleman’s sentiments, he recognised the force of some of his objections, and they should be very careful before endorsing this agreement. Even if we had to give the Chaffeys a few thousand pounds as compensation it would be more profitable than to sacrifice principles which might cost the country a great deal more. If the Commissioner of Crown Lands was earnest in his desire to establish irrigation colonies let him bring in a general Bill, and he would assist him to pass it. This measure bristled with difficulties which would perhaps involve the country in endless litigation. He hoped the Commissioner would withdraw the Bill with the view of introducing a comprehensive one, otherwise he should have to oppose it.

Mr. E. W. HAWKER thought that as he had taken a great interest in water conservation, and was a member of the Water Commission, he ought to say something with reference to the Bill before the House. He congratulated Mr. Glynn upon his very able speech, though he thought it was the most illogical one he had ever read. The hon. member pointed out that if 250,000 acres were irrigated properly the river would be exhausted. The hon. member went on to show the enormous profits they would make out of the scheme, and that therefore the Government should take it in hand. He also said the land at Bookmark consisted mostly of sand, and then said we had “no moral right to barter away for a mere song 250,000 acres of the best land in the colony.” (Mr. Glynn—“Best situated.”) Mr. Glynn had further informed the House that it was an educational lesson, but pointed out that after all Chaffey Brothers could not teach us very much, because although they had done a good deal in the way of irrigation in America they had not had any experience of the climate and soil of South Australia. In the same breath the hon. member said—“ If it were necessary to have a scientific teacher he had no doubt that we could get good men from California who would give instruction for £2,000 or £3,000 a year.” Yet California was the very country where Messrs. Chaffey had gained the experience which they placed at our disposal, and he believed he was right in saying that either or both of them would be very glad to take a salary of £2,000 or £3,000 a year to teach us irrigation. Quoting from Mr. Hannah, Mr. Glynn also stated that “The climate of California is very similar to these colonies ; what has been done there ought to be possible here ” There appeared to be some misunderstanding in the hon. member’s mind as to the quantity of land to be irrigated. He was informed by the Conservator of Water that at most only 90,000 acres can be irrigated, because the rest of the land is considerably over 50 feet above river level, some of it being 100 feet higher and more. It was well known that to attempt irrigation at a height over 50 feet is a very expensive matter. With regard to the character of the land Mr. Glynn said he “ believed the land to be irrigated at Bookmark contained a very large percentage of sand. The greater percentage being sand, and the balance clay, the water required would be the maximum allowance.” Now it happened that the opposite was the case, as they knew from their experience of their visit to the land, and from Mr. Jones’s statements. The subsoil was invariably clay, and over fully half the best irrigable area the clayey soil being on or near the surface, the minimum of water would be required. (Hear, hear.) A misleading impression had gone abroad as to what Chaffey Brothers are likely to make out of the scheme. Of course, if they were going to make a profit of £4,000,000 it would never do to pass the measure, but he did not think anybody who had thought over the subject believed they would ever make anything like that. (The Commissioner of Crown Lands—“ Hear, hear.”) In fact, he did not think they would object to take £40,000, or 10 per cent, on this imaginary profit, and leave South Australia perfectly satisfied, as to the amount of water to be used hon. members must remember that the Murray is highest in summer when most of the irrigation will be needed. The Conservator of Water had furnished him with the height of the water at the shallowest parts at different times of the year, and this information was borne out by Captain Barber’s evidence. The lowest known level in any part of the river was from 3 to 4 feet; at a medium flood, 12 feet; at a good. flood, 15 to 18 feet; and at the present level, 15 feet. In the big flood, such as that of 1870, it would be 18 feet above the present level. Mr. Jones stated that from his calculations to irrigate 100,000 acres at flood would lower the river only 2 inches, and at the lowest level it would require only 6 inches. Besides this there were various creeks which can be dammed back, and from which a supply can be drawn in summer, thus lessening the draft on the river itself. The Ral Ral Creek was 20 miles long and 40 feet deep, and a dam 6 feet high at the lower end would store an immense body of water. Further up the river was the Chowilla Creek, almost as large, besides several shallow lakes and other depressions which could be used for the same purpose. Mr. Geo. Chaffey said that when the river was low they did not expect to have as much water as when there is a large supply, but they expected to get enough to keep things going. Thus on the Riverina stations they were now cutting hay to help in keeping the sheep through a bad season, and the water stored in the creeks and ana branches must in the same way be looked upon as a sort of insurance fund. Mr. Glynn had objected that the water duties would be too high, especially in the beginning, and argued that the water rights should belong to the State, and quoted from Mr. Deakin’s report—“The owner of the water really owns the land, for it is useless without his supply.” The hon. member also pointed out that when the Chaffeys had sold the land they might leave the task of pumping the water to the Government or a company. Mr. George Chaffey had told him that there were two methods of dealing with water. Under the old system the water was sold separately from the land, and it was then found that the objections pointed out by Mr. Glynn arose. The Chaffeys had adopted another system by which they erect all the pumps and then sell the land. They did not charge the settlers anything for the original cost of the machinery, but after the land was sold and settled they handed over the pumps and machinery to the settlers who form themselves into a trust, and pay for the maintenance of the machinery and the canals as well as for the distribution of the water. (Mr. Glynn—“ How much do they pay per acre?”) He was not going to burden the House with billions of figures; he was dealing with the general principles. This system had worked well in America ; so much so that several irrigation colonies there had adopted it in preference to the old, the Riverside colony having spent a million dollars in buying up the company that used to furnish them with water. As to the navigation question that must be settled by the colonies concerned, and should be as soon as possible discussed by the water commissions. (Hear, hear,) His idea was that gauges should be fixed at certain points of the river, and when the water sank below a certain point those who irrigate must draw no more water from the river itself, but utilise the storage water in the creeks. With regard to heavy floods he would point out to Mr. Glynn that they rise so slowly that there is no question of their carrying embankments away. The hon. member had also asked—“Was it necessary for the purposes of irrigation to import Americans to teach us what the Hindoos had done for ages.” Certainly the Hindoos worked on exactly the same lines as their forefathers had done for centuries, but there was very little comparison between a people who still plough with a sharp stick and the energetic and inventive Americans. As to Government enterprise v. private enterprise he could not help seeing that in treating this question the hon. member was imbued with the land nationalisation scheme, and it destroyed the effect of his speech. (Mr. Glynn—" I never mentioned it in the House.”) He might not have mentioned it, but they knew he was imbued with it. He would like the hon. member to bring forward a motion on the question of land nationalisation and have it settled here once and for all, and then let the hon. member never refer to it again in his speeches. (Mr. Glynn—“ I should still get the slang of the press.”) The hon. member had pointed out that the Cavour Canal was a private speculation and a failure, but Mr. Geo. Chaffey had informed him that it was a job from beginning to end, and therefore a failure. He did not think anyone could say Messrs. Chaffey’s scheme was a job ; they had only to look at what the firm had accomplished in California. The Indian engineer whom the hon. member quoted as an authority was connected with schemes in that country which were failures, and was he therefore likely to be a good authority on this question? (Mr. Glynn—“He was not the only authority.”) He was the only one quoted by the hon. member. In California there was not a single irrigation scheme worked by the Government. With regard to Mr. Caldwell’s remarks, he understood that Mr. Bevilaqua wanted to take land more than 50 feet above the level of the river, and therefore the refusal of the Government to entertain the application had probably saved him his money. What we required in this matter was experience, and that was offered to us by Messrs. Chaffey. The great difficulty appeared to him to be that if the Victorian and New South Wales schemes are carried out, and every one on the banks of the Murray is using its waters for irrigation, the river will certainly have greater calls on it than it can possibly supply—(hear, hear)—and he believed they must as soon as possible induce the other Governments to meet the Water Commission of this colony, and settle what amount of water is to be taken. He would most heartily support the scheme as of great value to the colony. (Hear, hear.) He thought a great deal more of it since he had seen the ground, and he would certainly like to see Messrs. Chaffey make the four millions alluded to by Mr. Glynn. (Laughter, and hear, hear.)

Mr. SCHERK did not agree with the gloomy views enunciated by Mr. Caldwell, although he was at one with him as to the caution which must be exercised. He had listened with interest to Mr. Glynn, and. must acknowledge that his speech contained a great deal of very useful information. In his address to the electors in the Town Hall he promised to support the Chaffeys’ scheme, and in spite of what had been said and written against it, he saw no reason whatever to change his views. On the contrary, the more he considered the matter the more he was convinced that the scheme, if properly carried out, would be a step in the right direction—(hear, hear)—and would do much to restore the colony to a state of prosperity. They had to thank the late Government for the energy they had displayed in completing the agreement with Messrs. Chaffey. (Mr. Furner—“ One man sows and another reaps.”) We must consider ourselves fortunate in having found gentlemen whose experience would be of such incalculable benefit to South Australia. He had always expressed himself as against land syndicates and land monopolists, but in this case an exception ought to be made. The Chaffey Brothers had both experience and capital. We wanted both, and therefore he would support the Bill. One fact that induced him in a large measure to give in his adhesion to the Bill was the provision that the necessary machinery for the irrigation works was if possible to be made in the colony. He was informed that so soon as the Bill was carried in the House about 300 men would be employed at Bookmark, and that the employment would be constant. This was a matter which should receive careful consideration. He believed that if the scheme were carried out our population and our revenue would increase. It would, like the Exhibition, for which we owed our thanks to Mr. Smith, prove an educational factor of great importance. He could only express the hope that the labors of Messrs. Chaffey Brothers would be crowned with the very greatest success, and there was no doubt in his mind that the colony would benefit very largely from their operations.

Mr. BURGOYNE congratulated the House upon the speeches which had been made upon this Bill. The speeches of the Commissioner of Crown Lands and Mr. Glynn had come like a revelation. Had the eloquent word picture, with its rosy perspective looming up, been painted by Mr. Glynn, and the stern forbidding wall of fact built up in all its details, so as to be impossible to be removed, been presented by the Commissioner of Crown Lands, he would not have been surprised ; but the positions had been reversed, and they had had the first description from the Commissioner of Crown Lands and the latter from Mr. Glynn. He did not quite agree with either gentleman, and they might be regarded as the two extremes on this question He did not agree with the Commissioner of Crown Lands because he had given the reins to his imagination, and not taken quite so much care in ascertaining that he was sure of his ground, while his colleague had done a little injustice because he had compared this country with a country where, to take one point at least, evaporation was much more rapid than it is with us. The hon. member had also forgotten that in many respects we would be satisfied with a smaller amount of irrigation and with smaller results than was the case in some of the works he had referred to. Mr. Hawker was a member of the Water Commission, and had paid great attention to this subject, but has had only dealt with a portion of the question, and a portion which depended on premises he had not touched upon, and probably had not thoroughly examined. Mr. Scherk had, in estimating the advantages to be derived from the scheme, overlooked the fact that similar advantages would result if the work were undertaken by the Government. He (Mr. Burgoyne) had for years past spoken and written very strongly in favor of undertaking extensive works for the purpose of water conservation and irrigation, and in doing so had denounced the apathy and folly we as a colony had exhibited in allowing the River Murray to pour its millions of tons of pure and fertilising water into the sea while thousands of acres in the valley of the Murray itself are allowed to remain comparatively unproductive and useless. He was of that opinion still; and certainly thought it a disgrace to the colony, and a serious reflection on those who had had the control of her destinies, that nothing had yet been done in this direction. It was quite time that this blot was removed from our character, and he was glad to see that some attempt had at length been made to do this, even if the means proposed were not the wisest and best. When before his constituents he said with reference to this agreement with the Chaffey Brothers that although the late Government had not done the best thing they had adopted the second best course, inasmuch as they had taken some steps towards the utilisation of the waters of the Murray ; and if nothing better was proposed, and the provisions and conditions of the agreement were found after careful consideration to be consistent with the general interests of the country, he would heartily support them in their action. His own opinion, however had always been that the Government should undertake and carry out these works on behalf of the colony, thus not only securing the immediate benefits resulting from an increase of population and increase of production, but securing also to the State the enormous prospective increase in the value of the land on which the water is placed. It seemed, however, from the action of this and previous Governments that our rulers had not sufficient faith in the country, or not sufficient confidence in their officers to enter upon a work of this kind. He was sorry that this was the case, and could only say that if the fates had placed him upon the Treasury benches he would not have lost a single day before he had taken some steps towards having a work of this kind carried out. Since, however, Ministry after Ministry had refused to undertake this responsibility it only remained for us seriously to consider the next best means by which we could obtain some although not all the advantages within our reach. Having carefully considered the agreement which they were called upon to ratify, and having examined the river itself and taken into consideration our position with regard to the supply of water, the claims of the adjoining colonies, and the rights of those who were interested in the lower portion of the stream, he had come to the conclusion that we ought not to accept the agreement in any case without considerable modification. He knew something of the river from its mouth below the lakes to its junction with the Darling at Wentworth. Of the upper portion above Wentworth he had no personal knowledge, having only such information as could be obtained by all hon. members from the books, reports and maps which had been issued. To anyone who had seen the River Murray, and who was acquainted with geology and physical geography, it would be evident that an enormous change has taken place. We were apt even now to look upon the Murray with some degree of pride, and to designate it a noble river, which it undoubtedly is; but there was a time when this river, instead of being some 300 yards in width, was from one to three miles broad ; in fact the river was then bounded by what is now the high land on each side of the valley through which the Murray runs. At that time, too, it was evident that the stream drained an enormous lake which covered the country where Wentworth now stands, and may have extended some hundreds of miles beyond. Now had those conditions remained the same, or if we had arrived here a few thousand years earlier, perhaps the sanguine anticipations of the Commissioner of Crown Lands might have been thoroughly realised, and we should certainly not have had to trouble ourselves about the sufficiency or insufficiency of the supply of water. Unfortunately, however, a great change had evidently taken place since then. Whether the present conditions were permanent we could not tell, but as these natural changes were although sure so very slow in their operation we need not trouble ourselves on that score. There were, however, other causes now in actual operation of which we should probably soon see and feel the effect, and it would be nothing short of folly to shut our eyes and simply ignore that which we could not avoid. The neighboring colonies of Victoria and New South Wales have like ourselves awoke to the necessity of irrigation and the folly of allowing the wealth which exists in their rivers to be wasted year after year. They talked of irrigating millions of acres, and there was little doubt that during the next few years very large irrigation works would be entered upon, especially by Victoria. Now unless we were able to come to some understanding with our neighbors as to our respective water rights we might in the course of a few years, or even sooner, discover that we had no water left for irrigation purposes. Those who had not taken the trouble to look closely into this question seemed to have taken it for granted that with such a noble river as the Murray we should always have an ample supply of water even for irrigation, and that any demands upon the stream by the neighboring colonies would not materially affect us. This was, however, a great mistake. He thought it was essential that we should as soon as possible come to an understanding with our neighbors as to our respective rights, and that this should be done before we committed ourselves to any undertakings which would confer a right upon any person to a possible monopoly of the greater portion of the water we should have to spare. If we could come to some such understanding by which we could secure to ourselves even one-third of the present supply we should then have something definite to rely upon. Without this understanding we should really be to a considerable extent at the mercy of our neighbors, who might during several months of the year take away the whole of the water supply from the river, and leave us with a dry channel. Our position in regard to the water supply of the Murray was very different to that of the neighboring colonies of New South Wales and Victoria. We had within our boundary no streams of any consequence which act as feeders to keep the supply of water in the river. Then, too, the stream of the Murray itself flows through a valley of considerable depth below the level of the adjoining country, so that to divert the water on to any large extent of country we should require a very large expenditure of motive power. This was not the case to the same extent in the colonies on the upper waters of the Murray, as on many of the streams from which our supplies are derived the fall of the country was more rapid, and the stream itself not much below the level of the surrounding country, so that it required but a few dams across these rivers and as many cuttings, or no great importance, to divert the whole of the water from its present course altogether. It had been shown by Mr. Glynn that if we had the whole command of the stream we could only irrigate to the extent of about 3 million acres to a depth of 12 inches, and hitherto the hon. member’s contention had been unanswered. But as we could only hope in the near future to receive about one-third of the present supply, it would be the prudent and wiser course to accept that eventuality, and to calculate our resources accordingly. Let them see then what we really might have to deal with, and what might be done with that. The whole of the water discharged by the river during 1884 was, as stated by the Commissioner of Crown Lands, 210,000 million cubic feet. This it was true had been the minimum of several years, but on matters of such importance we should depend as little as possible upon chances, and take only what we might reasonably expect to be realised as the basis of our calculations. (Hear, hear.) Besides if we made larger demands on the stream on the faith of more favorable seasons when the minimum supply again came it might witness disaster, and certainly will bring disappointment. He would assume then that we had what he thought we might fairly claim—one- third of the whole supply of the Murray, or 70,000 millions cubic feet of water every year. Let them see what we would be able to do with this large body of water, and then they would be the better able to judge of the wisdom or otherwise of our ratifying the agreement we had now before us. It must be evident that if we hoped to establish other irrigation areas on the river, as it was hoped we might do, and leave a sufficient amount for the supply of those who had water rights on the lower portion of the stream, we could not give the right to an unlimited supply of water to any one person or company. First, then, could we use all this flow of water for the purposes of irrigation, cutting off the stream altogether, converting the lower bed into a dry gorge in a desolate country, and changing the fresh water lakes near the mouth into malarious salt swamps? He scarcely thought one hon. member would reply to this question in the affirmative. If we were to retain the water in the lakes and the lower Murray in a fresh condition it would be necessary with a greatly diminished flow to dam the fresh water in and the salt water out somewhere near the present mouth, and to allow a sufficient quantity of water to flow down the stream to supply the requirements of the settlers on the river and the lakes, and to keep the latter full, sweet, and fresh. What would be required for this purpose ? Taking in the first place then the lakes, and leaving for the present the requirements of the settlers and the loss by soakage and evaporation on the river itself, let them look at the amount of water which would be required to supply the loss by evaporation on the lakes every year. We are told on the best authority, that of our Astronomer-General, that the annual loss by evaporation amounted to a depth of 5 feet over the whole surface. If we took the areas of the lakes at 250 square miles, which was within the mark, we would find that the annual loss by evaporation on the lakes alone would amount to 34,848,000,000 cubic feet. Now if we took an amount equal to one- sixth as the amount required for evaporation on the river between Morgan and the lakes, and for the requirements of the settlers on the river, we found that in round numbers we must take 40 billion cubic feet from the total supply for the purposes mentioned. This would leave 30 billion cubic feet available if we did not allow any of the water to flow out to the sea. The Commissioner of Crown Lands made one very curious statement in the course of his speech, and Mr. Hawker repeated it. He did not know that he would have referred to it but for the fact that it might be misleading to hon. members who did not care about the laborious task of working out these calculations. It was to the effect that Chaffey Brothers would be to a great extent independent of the flow of the main channel, as they could impound a large quantity of water in the Ral Ral Creek and the two little lakes on that creek. Now, as the total flow of the river had been taken for the year, this included the water which had lodged for a time in these back channels, which when the river was low emptied themselves into the main channel. Even were it otherwise and this had to be added, it would make scarcely any difference, as the whole of the water which could be retained in the Ral Ral Creek would only be sufficient to irrigate 4,360 acres of land. The utmost quantity which we might reckon to have at our disposal was, as he had said before, 30 billion cubic feet, and at 18 inches for the annual supply this would be sufficient to irrigate 4,360 acres. This being the case, he thought it would scarcely be advisable to alienate in one block more than half this quantity of land, and he would, if in order in doing so, endeavor to amend the agreement, so as to limit the grant of land to Chaffey Brothers to the 30,000 acres first intended to be dealt with. He was sorry that we had to alienate this land. The principle was a false one, and we should not thus give away the right of the people and of our posterity; but unfortunately there appears not to be sufficient energy and skill among the rulers of the country to turn this land and water to a good account. The time will, however, come when wiser counsels will prevail, and then those who had taken the unpopular side on this question would be better understood, and would be remembered with gratitude by the people for the action they had taken. While supporting the second reading of the Bill, it was with the sincere hope that the House might be able to amend it in the directions he had indicated, and if they did that he thought, although they were giving away a great deal that they ought to retain, we should probably have corresponding advantages which would be found to be of considerable benefit to the country. (Hear, hear.)

Debate adjourned.