

DEFENCE PRODUCTION IN AUSTRALIA

30.1. 64.

A copy of the relevant parts of the above abstracted from the original manuscript of a historical record compiled by Sir John K. Jensen.

(The numbers refer to the page of the original copy.)

INVESTIGATIONAL WORK IN ENGLAND.

13. The men trained by Mr. Topp in Australia had no difficulty in taking up the running with the aid of the technical data collected during 1917 and 1918. The same applied practically to the, Q.F. Ammunition section under Messrs. Wrigley and Fowler, which however was concerned only with the non-ferrous components of the complete cartridge, the steel shell placed for manufacture with the Gun and Carriage section. The non-ferrous components are the Brass Cartridge-Case, Primer and Gaine - the latter being an introduction of World War 1 for purpose of "boosting" the ignition of high explosive (hence the American designation "Booster"), whereas the Fuze can be in brass or aluminium. As the mechanical operations involved in manufacture of metal components are usually set out in "Operation sheets" wherein are described the sequence of operations on selected machine tools or by hand, the type of machine tool used, a drawing of the tools and gauges employed, type of material used, minutes employed, and so on, the manufacturing data was ordinarily easy of access but as the manufacturers customarily worked out for themselves the technique to be employed, and this depended largely upon the machine tools they had available, and also the facilities they possessed for making their fabricating tools, a great variety of details of methods of manufacture had developed in the numerous works employed in such manufacturing during the war. This meant that Messrs. Wrigley and Fowler, in addition to study of the processes designed in the parent establishment: Royal Arsenal, Woolwich, had also to study them in the National factories and leading commercial factories, and select the most appropriate for installation in Australia, having regard to the comparatively small demand likely and the engineering resources generally of Australia, and not overlooking the desirability of introducing modern methods, the question of local raw materials, and the economics of the matter. Before these enquiry officers had left England, Mr. Fowler in 1918 and Mr. Wrigley in November 1919, all the data necessary had been collected, a pilot plant for Fuze, Gaine and Primer production had been purchased, together with a selection of tools, gauges, jigs and fixtures, with the result that within two years fuzes had been made in Australia and tested for service. The plant for Cartridge cases will be dealt with shortly.

Mr. F. C. Spiller was in charge of the study of Gun and Carriage production, the standard patterns of World War 1 for Field Artillery being the 18 pdr. Q.F. Gun and the 4.5 inch Howitzer, the difference being that the 18 pdr. was designed for long range and low trajectory whereas the "Howitzer" designated a high trajectory with shorter range and thus was more suited for action against emplacements and trenches. After World War 1 the special features of each type were incorporated in the one weapon: the 25 pdr. Q.F. Gun-Howitzer. From the end of the war until about April 1919, Mr. M.M. O'Loughlin was Mr. Spiller's sole assistant, but after Mr. F. S. Daley arrived I was able to attach him as additional assistant to Mr. Spiller and arranged that while Mr. Spiller in addition to his supervisory duty would also have charge of factory construction and equipment and study Forging, Smithy and Heat Treatment processes, and also Shell manufacture, while Mr. O'Loughlin would concentrate upon Gun production and Mr. Daley similarly would study Carriages and Mountings, Ammunition Wagons and Limbers and Vehicles generally. By the end of 1919, the greater part of the enquiry work in regard to the Guns and the Forging section had been completed and Messrs. Daley and O'Loughlin sailed for Australia in October and December respectively.

The Royal Arsenal at Woolwich was the principal centre for manufacture of the Guns and Carriages and every step of the processes employed from raw material to finished product was studied and recorded on paper and drawings by the three enquiry officers in their respective fields.

In fact they had an advantage, almost, over the Woolwich technical officers in that a new type of carriage for the 18 pdr. gun was being designed and built out of the war experience; there were radical changes in the recoil system, and as our officers were present from the inception of the new design, they had opportunities for an overall view of the complete gun equipment not then available to the Woolwich staff generally. The officers also visited the principal armament firms and inspected processes and discussed details with the technical experts there in all cases where it would be of value in our plans. In general we decided to depend upon our own resources for provision of the tools and gauges required in manufacturing, full details of all these had been obtained.

PROPOSAL TO PURCHASE PLANT.

48. I suggested I should be allowed to draft a definite proposition to the Imperial Government setting out just what we wanted in such terms as would permit of a direct answer. Senator Pearce agreed to this and on 15th September he despatched a letter to Lord Milner -

" I am in receipt of Mr. Thornton's letter of 3rd September relating to the Munitions plant for Australia, and as suggested a conference with representatives of the Ministry of Munitions is being arranged.

I am afraid, however, that such a conference can do little until it is definitely settled how far H.M. Government is prepared to assist Australia to make herself self-supporting in the way of Munitions production.

Lord Inverforth estimates that our requirements of plant will cost £600,000 or more, but my officers advise me that plant of a value of half that amount, £300,000 should go far towards satisfying our present programme.

I am anxious before I leave England next week, to carry with me a definite proposition from the Imperial Government, and I therefore suggest that some arrangement like the following might be considered by the War Cabinet:-

- (1) That the Imperial Government be prepared to place at the disposal of the Australian Government, Munitions Plant of the "fair disposal value" of £300,000.
- (2) That as to what constitutes "Fair disposal value" be agreed subsequently between representatives of the Ministry of Munitions, and of the Australian Government, and that failing agreement, the matter be referred to Colonial Office for submission to the War Cabinet.
- (3) (a) That in consideration of the Australian Government installing the Munitions Plant here in referred to in Government Munitions Factories, it shall be presented to Australia as a free gift; or alternatively,  
(b) That it shall be transferred to Australia at a price being "fair disposal value" less..... per cent. (Insert here the discount the Imperial Government is prepared to allow.)

You will see from this that I have limited myself to Plant worth £300,000 and that it is simply for decision by the Government as to how far it is prepared to Assist Australia.

"Their recent services sufficiently demonstrate this, and I am sure it will be accepted as acknowledgement that those services have been appreciated, if the suggestion in 3 (a) can be given effect."

This letter was carefully designed to force the British Cabinet to make a decision No. (1) above was to fix it in everybody's mind that £300,000 worth of plant was to be the total value of the transactions. Everybody was thinking in terms of £600,000 and I alone was satisfied that £300,000 could be the figure; I gambled on the anticipation that the Ministry of Munitions would eagerly support the £300,000 with a feeling that it would be a cheap way of disposing of our "pretentious aspirations", (as I could imagine the Ministry opinion of the matter) especially when the amount was specifically stated as being based upon "fair disposal value". I should explain here why the expression "fair disposal value" has been used so freely in the correspondence; it will be recollected that during the previous July I had been engaged in argument with the Ministry officials as to prices they had quoted for surplus plant; they claimed 49. it to be reasonable that sales should be effected at "market values", which to them meant their assessments of the values, whereas my argument was that the real price was whatever they could get at auction or by negotiation, and that they should not ask the Australian Government to pay any more than that. Having regard to the fact that they were required for munitions production and not commercial purposes. I composed the expression "fair disposal value" deliberately as a counter to "market values"; with the intention that "disposal value" would be a price acceptable to me and that we would not be bound to take any machine offered unless I was agreeable; I prefixed the word "fair" with the intention that the disposal value could only be fair if it were agreeable to both parties, and I included a clause in our proposal that there should be reference to the Colonial Office for a decision if one claimed the value to be fair and the other disagreed; I knew the Ministry would never go that far but they didn't know what I might do. I had no intention of forcing matters that far; I was completely confident that I could "out-bargain" them in negotiations as long as they did not have a right to fix selling prices. Sub-para (3) was designed likewise to force decision upon a price; I was satisfied after our meeting with Lord Inverforth that it was extremely unlikely that we would be invited to accept a gift of plant unless after prolonged negotiations, and that even should we be successful in that it would be of little use to us for two reasons: (a) we could scarcely be exacting as to what we might accept or reject, and (2) most of the useful plant would have been sold by then. Nevertheless I persisted in 3 (a) with the idea of a free gift so that it would be something for Cabinet to reject and thereby "soften" the attitude with which the suggestion of a rebate would be considered as shown in the wording of 3 (b). I thought first of suggesting a percentage figure for the rebate, but decided to leave a gap thus providing opportunity for an exercise of generosity after the rejection of 3 (a). In short, it could not be expected than anything lower than 50 per cent rebate would be decided, but it would not have been surprising, if I had suggested 50 per cent, to see an advance of that to 60 or 66 per cent.

PROPOSAL ACCEPTED

As it was, the decision came out exactly as I had hoped, on 25th October I was asked to call at the Ministry of Munitions and was handed a copy of a cablegram despatched to Australia through the Colonial Office on 11th Oct. -

"War Cabinet decided October 9th to place at disposal of Commonwealth Government munitions plant fair disposal value £300,000 less 50 per cent."

50. Thereupon I cabled to Senator Pearce, then at sea on his way to Australia -

"Imperial Government cabled Australia offering 300,000 pounds worth Munitions plant for 150,000 pounds. I have explained scheme to Defence and presume you will cable urging acceptance as they desire immediate reply. I am confident we can get nearly all plant required for 150,000 pounds. For instance was authorised purchase Cartridge Case machines for 20,000 pounds but succeeded in acquiring them for little over 10,000 pounds and hope to do just as well in other lines if given authority."

On the same day, 27th October, I sent a cablegram to the Defence Department explaining the whole scheme, and what was meant by "fair disposal value", and also I outlined broadly the procedure I proposed to adopt in negotiation for the machines. We must leave this now for some months, pending consideration by the Australian Cabinet, and while awaiting that it will be opportune to mention the Cartridge Case transaction noted above.

#### CARTRIDGE CASE PLANT

It will be recollected that Mr. Leighton had been given authority during 1918 to purchase plant for manufacture of Quickfiring Ammunition, and that he had gone some way in that connection with respect to the Shell and Fuzes, and also the T.N.T. high explosive. He had also initiated enquiries in regard to the plant for production of brass cartridge cases but had not got far with this before he sailed for Australia, and then came the prohibition of further purchases of Arsenal plant except that I had evaded that in some minor cases which had presented themselves. Nevertheless I had done nothing about the Cartridge case, mainly because none had become available for disposal by the Ministry of Munitions, but also my financial resources were insufficient for the large amount of money necessary for that particular requirement. On 1st July 1919, I received a cablegram -

524/5/311

"Are preparations complete for purchase of case making plant 18 pdr. Possibility of my despatching orders early and wish you to be ready."

To which I replied -

"Negotiations Case making plant unsatisfactory as Ministry retaining Birtley (National Factory) and uncertain whether other plant available but matter being pressed. Possibility of orders noted. Minister now negotiating with Imperial Government and hoping acquire all plant very favourable terms."

This, it will be noted, was the first time I had mentioned the Minister's negotiations to Australia. I followed this up by sending copies of the correspondence by mail. The Minister also advised Senator Russell, the Acting Minister, that there was possibility of successful negotiations with the British Government. On 30th July I was able to advise Mr. Leighton -

"Ministry offer complete Cartridge Case plant for £20,000 sale by auction deferred pending decision which required immediately. Recommended."

51.

This offer of plant, which was located at Waterford, Ireland, was a result of my personal enquiries at the Disposals Office of the Ministry, which was housed in temporary buildings standing over the gardens adjoining Charing Cross station on the Thames Embankment. Mr. Leighton asked for an extension of time, and in cabling that this had been secured I was able to tell him that the Minister had approved of the proposal. It being thus demonstrated that there was a favourable attitude in Australia, I sent Mr. Wrigley to Ireland to inspect the plant. I was able also to arrange for an Engineer from Woolwich Arsenal to accompany him and as they recommended it as suitable I sent the report to Australia during September. Further I was able to see the plant for myself during a brief tour of Ireland and noted other machines for sale which I thought would be useful in our factory. I sent another message to Mr. Leighton on 6th October -

"Cartridge Case plant now advertised for sale by auction this month, telegraph if we are to bid for it. Failing this we shall probably have to purchase new plant."

and on 14th October -

"Cartridge case plant now advertised for sale by auction 21st October, are we to miss this opportunity of acquiring complete plant of suitable requirements."

Obviously there was now only a week left for decision, and when a couple of days had passed without any message I began to despair, but then, suddenly, everything was bright again, on 17th October a cablegram arrived -

"Purchase of casemaking plant £20,000 approved. Please complete negotiations."

for the first time since I left Australia fifteen months ago, a forward step had been taken; up to now I personally had been working in opposition to the intentions of the Government; that is as a collective body, I knew that I always had Senator Pearce in sympathy with what I was doing; I was certain also that the tide would change when Mr. Leighton had settled down after his long absence from Australia, and it was clear that his weight was now beginning to be felt.

#### AUCTION AT WATERFORD

Without saying a word to anybody, I was too excited to speak, I stood up from my desk, walked downstairs into Maiden Lane and then down the lane of the Adelphi Theatre adjoining our office into the crowded Strand. There I turned left to walk the 500 yards to the Ministry offices, thinking how in dramatic style I would call off the auction, and how, if I had been given the approval a month ago, I would have handled matters differently. And then suddenly another thought flashed into my mind, I had gone about 100 yards; I stopped and turned on my heel and walked back to my office; I called Mr. Wrigley and showed him the cablegram; his eyes flashed, he was to operate this big plant in Australia: I said: "We are not going to tell the Ministry about this; we will let it go to auction and buy it then."

52. It was important that the Ministry should not hear anything about our intentions or doings because if they did it was certain that they would increase the reserve (if any) on the plant we required. For my part I felt it to be extremely unlikely that there would be anybody else to bid for the plant, except perhaps the Japanese Government; they had been buying munitions plant elsewhere and still had three clear days and it suited us to arrive at Waterford on the morning of the sale. As the Cartridge case plant was not to come on until the second day, there was little to do on that day except stroll unobtrusively around the factory, glancing briefly at the items we had noted as being useful in our proposed factory, and watch the bidding. I had my own ideas about the values of the general purpose machines being offered and thus I was able to note the bidding as a guide to the current demand and the prices buyers were prepared to offer. We were alert also to the possibility of a Ministry official acquainted with either of us being in attendance at the sale, but nobody recognised us and anyhow there was a group of buyers present receiving quite an appreciable amount of interest and deference from the auctioneers and others - they themselves had a demeanour which indicated that they were conscious of their own importance - and that probably diverted attention from the ordinary people amongst the buyers. The sale of the Power Plant was interesting in that there were many bidders, dealers mostly I think, and here the gentlemen just mentioned became active, we learned that they were representatives of the Ford Motor Company, whose factory was at Cork (Ireland); they seemed determined to get the power plant, the auctioneer knew it and played the contestants accordingly, thus obtaining a very good price. The evening meal at the hotel was very interesting; the dining room was packed, probably visitors for the sale predominated, and the centre of interest was a large table at which were seated the auctioneer and his guests; the Ford representatives leading. Mr. Wrigley and I dined à deux, talking little and covertly observing the surroundings, still on the watch for any Ministry official that might turn up. We noticed the auctioneer glance our way several times, endeavouring to place us we thought, but there was no sign that he thought us to be of any account.

And then on the next day came our big chance; the single purpose plant had been deferred until the last, probably to allow the bulk of the buyers to get through and depart. I was taking a risk in letting this cartridge case plant go to auction because it was the only one, out of the three owned by the Ministry, to be placed on the market; of the other two: one at Birtley, near Newcastle,

53. I had therefore to get the Waterford plant at any price, and there would be trouble for me if it brought more than £20,000 at auction. Furthermore, it was nearly new, and we had been informed by an engineer, unconnected with Government, who had seen all three factories, that it was the best of them. The principal group, the American-built Power presses, were to be taken first, and I had decided that at the outset of bidding I would do nothing, "lie low", and discover my competitors. The auctioneer opened by offering the Presses as one lot and a speculator bid £5,000, but I did not bid at all. The auctioneer emphatically refused the £5,000 and said that unless a reasonable price was obtained, the machines would be sent over to England for sale there. He disclosed that there was a reserve of £10,000 on the group of presses and that it could not be sold for less. He then commenced offering single presses and again speculative bids were made while I stood by and said nothing. All these bids were refused and then the auctioneer said something to the effect that the group of presses would be withdrawn from sale, when I stepped in and offered £10,000 for the lot. There was consultation at the rostrum, obviously with the Ministry official, and I was asked in a tense silence to state my credentials. "Australian Government" I replied, sensation amongst the audience probably because I had been keeping quiet for so long, the Ministry officials by now had realised who I was, and the offer was accepted. The remaining machines in the cartridge case plant were then put up in lots, and as there was no competition, perhaps I had "frightened off" the dealers and scrap buyers, I was able to name my own price and purchased them for £510 in all. The total number of machines purchased for the £10,510 was 18 presses and 25 finishing machines, and they were identical with those offered for £20,000, except that I had secured 10 additional finishing machines, and I rejected two wornout furnaces from the original offer. Later in England I bought a 200 ton press from the Gramophone Co. Ltd. to balance the Waterford plant in one operation and also six other machines useful in cartridge making at cost of £501. I also had to buy elsewhere some furnaces and accessory equipment, so that altogether including costs of dismantling and packing and conveyance to ship, a total expenditure of £13,023 was incurred, and I estimate that if all this plant had been purchased from the makers it would have cost £41,220. We also had some trouble in removing the plant. Overseas ships could not take on cargo at Waterford and the railways could not carry it to Dublin. Small lots therefore had to be shipped from Waterford to English ports for transhipment to Australian bound ships but when the first lot was assembled on Waterford wharf it commenced to sink and thus even the small lots had to be limited. The heavy lifts had to be sent by rail to Belfast, at the other end of Ireland, to be shipped to Glasgow and nine 10 ton trucks and one 40 ton truck were employed in this transfer. To conclude the notes of this transaction, it is recorded that through the fortunate purchase of one more cartridge case press in England, from the Gramophone Company (H.M.V.) of Hayes, Middlesex, I was able to assure Australia of a complete manufacturing unit for production of 270,000 brass cartridge cases for 18 pdr. or 4.5 inch Q.F. Ammunition per annum on an eight - hour day basis. The programme called for an output capacity of 160,000 cases annually so that a good margin was available in reserve. I would like to add also that if I had been advised by the Department some time in August, before the auction sale had been announced, that I could negotiate with the Ministry, I am confident that I could have purchased the whole of the contents of the Waterford factory for £25,000. If I had succeeded in that, I would have taken out all the items required for Australia and put the remainder up for auction.
- I know the purchase cost of all the items and I formed the impression that the Disposals Branch considered the Press Plant and accessories to be the big item that not much would be realised for the remainder; they were not aware then of a market for the power plant. It was because Waterford was as remote from the remainder of the British Isles, and the shipping facilities so poor this view point had developed. The sale realised £39,000 so that had I been successful in the exercise of my ideas there could have been a profit to pay into Australian revenue. Anyhow, I was very well satisfied with myself; I had saved £9,500 out of the £20,000 I had given to spend, and had bought something badly needed for Australian Defence, because without this plant, we had everything else, we could not make ammunition for our Field Artillery and would be completely helpless if invaded by an enemy.
- 54.

Furthermore it was the most modern plant of its class, nearly new, and capable of an output nearly twice the quantity specified in the Army programme. It was well incidentally that I was happy in my own satisfaction; I say this advisedly, because whereas my report of 29th November 1919 contains a full report of the proceedings, there is not a single mark on the papers to show that any of my superiors were appreciative of my handling of the transaction, and not a single word has ever been said to me about it.

PLANT OBTAINED AND COSTS.

76. And now to record the results; for the £167,060 we obtained 1656 machines, a very generous interpretation by the Ministry of Munitions of the offer made originally by the Imperial Government, seeing that in May 1920 I had estimated that we could manage with 1175 or thereabouts but the latter figure was built up mainly on the requirements for the Maribyrnong factories and Lithgow extensions were only to come in after those were satisfied. As it turned out I was able to satisfy nearly all the proposals for both groups of factories, apart from specialist high precision types which could scarcely have been expected in any circumstances. The distribution was as follows:-

<u>VICTORIA</u> (Maribyrnong and Footscray)		
Guns and carriages	516	
Forge and smithy	44	
Shell	83	
Cartridge cases and fuzes	29	
Aeroplanes and engines	78	
Woodworking	62	
Miscellaneous	<u>49</u>	861
 <u>NEW SOUTH WALES</u> (Lithgow)		
Machine guns	177	
Rifles	364	
Pistols	43	
Machine Shop	71	
Toolroom	75	
Small Tool Shop	<u>49</u>	779
Transferred to Military		16
	TOTAL	<u>1656</u>

and it was contemplated that with the installation of these machines, in conjunction with those already in possession of the Department in Australia, the Department would be in position to undertake production of all types and quantities of Munitions laid down by the Military Board in November 1918. This programme incidentally was based upon working 48 hours weekly so that in time of war, by working three shifts daily, the productive capacity could be  $2\frac{1}{2}$  times greater. Furthermore, in the acquisition of the particular machines, we had so far looked ahead, that in many cases we were able to make selections capable of handling munitions of sizes larger than those specifically stated in the programme; larger guns, for example, than the 18 pdr. stated as a current requirement.

Amongst the purchases, there were some items worthy of special note; the 1500 ton Hydraulic Forging Press for example. The list of requirements stated an 850 ton Press as being desirable for the production of 18 pdr. guns, but with the policy mentioned above in mind I applied for a 1500 ton Press owned by the Ministry but located in the works of the Darlington Forge Company.

77. The Company was hoping to acquire this Press, already installed as it was, for its own purposes, and the Disposal Board, whilst willing to give us the preference, was fully aware of the situation and played one off against the other; for once I was unsuccessful in my bargaining and forced to agree that in this case "fair disposal value" meant the full commercial market price. They fixed a price of £17,000 inclusive of accessory equipment, notwithstanding that I was aware that the price paid to the manufacturer was nearly £11,000, but on enquiry at Woolwich Arsenal I was advised that the current price at manufacturer's would be about £15,800 exclusive of the accessories and as there was no likelihood of any other of the size coming on the market, I capitulated. Of course the actual cost to us was only £8,500, but as previously stated, I never allowed the 50% rebate to influence me in determining the price to be offered for a proposed purchase. The moving of this plant to the seaboard was quite an event; it weighed 260 tons - one piece alone weighing 28 tons - and a special train had to be engaged to carry the 100 packages to the seaboard. Incidentally, it will be convenient to mention here an amusing occurrence relative to arrival in Australia of the 28 ton steel casting. As it had to be stored at Maribyrnong, its transport across the concrete bridge of the Maribyrnong river presented a problem inasmuch as the safe limit for the bridge was 15 tons. In these days horse transport only was available for heavy packages, and when the problems of carriage were discussed our resourceful Stores and Transport Officer said that the Maribyrnong bridge was to be left to him and no questions asked. Later we learned that he mounted the 28 tons on the customary jinker drawn by 14 draught horses and timed the move so that he arrived at the bridge at midnight. Here there was a pause and it could be imagined that the horses thought they were having a rest when suddenly every single one of them was belted simultaneously midst loud yells of "gee-up"; they bounded forward under the continued vociferations and beltings and in no time they were over the bridge and in no time resumed the tenour of their way. Furthermore, tests proved that there had been no deflection of the bridge. Another heavy and expensive equipment was a drop forging plant weighing 150 tons, the heaviest piece being 23 tons; it consisted of four drop hammers with twelve furnaces, oil storage tanks, etc., the agreed value being £7,000 against the £10,000 stated as the current manufacturer's price. A complete rolling mill equipment for 18 pdr. cartridge case metal was also obtained at agreed value £5,800 as against the £13,000 or so necessary to purchase a similar plant from the manufacturer. It will be apparent that all this plant must have been of incalculable value in our war production of 1939 - 1945.

78. In contrast with the foregoing, and perhaps it may be interesting as an example of my methods of bargaining - especially as I find it amusing even now - I am giving space to another transaction concerning Automatic gauging machines for .303 cartridges whereby the finished ammunition is fed into the machine by means of a loaded hopper and thereafter passes from gauge to gauge until it emerges at the end of the sequence accurate in all measurements to limits of a thousandth of an inch, or otherwise is rejected at some point on its way through the machine. The remarkable feature of the machine is that according to the reason for rejection the cartridge affected is deposited one of twelve separate compartments selective according to the type of error discovered in the gauging; by this selective process the cause of the error became known and the cartridge affected or the machine causing the error can be corrected. I discovered these machines in a store outside London, and as I had never seen them before became inquisitive as to the purpose; I learned that they were of German invention; that some had been acquired before the war and had been reproduced extensively for the many wartime small arms cartridge factories. I learned further that the manufacturing cost had been £500 each, and also that some had been sold by auction in another district for £2,200 each. I knew that all this gauging was done by hand, by female labour, in Australia, and I determined to purchase six out of the eleven available; that it must be done carefully, avoid giving an impression that Australia would be a market for them. It was August 1920, I wrote.

"We are willing to take two of these at £20 each although they are not included in our list of requirements". On 13th August there was a reply: "the Board cannot consider your offer of £20

78. On the next day I asked that the application for two machines should be deleted from our request. I gambled that they would remain unsold. At the beginning of December it was notified that the machines were to be put up for auction and on 3rd instant I listed them again in an application at £20 each, stating "We do not desire these items withdrawn from the sale but they can be bought in for us at the prices offered if you agree". On 6th December they telephoned me suggesting I should offer a higher price but I declined, saying they could go to auction as far as I was concerned. On 10th December, after the auction sale, they telephoned me again, as a result of which I offered £30 each for the two applied for and this was accepted. I wanted them badly but I had restrained myself for four months! This episode, I think, finally convinced the Disposals Board that I was well informed in regard to selling prices and would adhere fairly strictly to my offers. I still had to get the other four, but I restrained myself for another month and on 10th January wrote: "I think it would be advisable to take over two more of the Cartridge Case Gauging machines for storage against emergency". This was at the previous price and the application was granted. Meanwhile Professor Sir Henry Barraclough of Sydney asked me to let him know, should I become aware of any ingenious examples of mechanism, to advise him as to purchase for the University School of Engineering. He was very pleased when I suggested one of these machines, and consequently we secured a fifth one for Australian use if required. On 13th July, just before I left for Australia I applied for two more of the machines and these were made available just as I was leaving England. After my arrival in Australia in September 1921, I wrote to Australia House, London, regretting my error in applying for two instead of four during the previous July, and would they please adjust the matter by sending out two more. This was successful also and thus by the exercise of patience over 15 months we obtained eight altogether for the Ammunition Factory and one at Sydney University at the outbreak of World War 2. As each machine eliminated the labour of six girls per shift, it will be seen that my apparently laborious manoeuvring at cost of £240 less 50 per cent saved the labour of 48 girls per shift during the war in the manufacture of .303" cartridges besides providing a greater assurance of accurate gauging.
- 79.

The financial side of my activities in England are worthy of record. Taking first the transaction with the British Government, I have stated that for an actual expenditure of £167,060 we received 1656 machines, and I can add now that at current prices of 1920 they would have cost £617,095 if we had purchases in England from the manufacturers or their agents; there was no doubt about that because the estimate was based upon the current price lists or other reliable sources. Many were secondhand but also a considerable number were new and I recorded the condition of each machine at the time of purchase - the figures were as follows :-

<u>Condition of Machines</u>	<u>No.</u>	<u>Estimated cost if purchased from Manufacturers.</u>
		£
New	583	199,518
Very Good	520	273,169
Good	449	118,621
Fair	104	25,787
<b>TOTAL</b>	<b>1,656</b>	<b>617,095</b>

Furthermore I emphasise the fact that at the outset I set up a high standard of quality and adhered to it resolutely throughout. The machines classed as "Very good" were really in new condition but could not be so classed because they had been slightly used. The "Good" machines were in firstclass condition, and those marked "Fair" were good sound machines but requiring some small repair or overhaul before they could be placed in the higher class.

80. Finally, to complete the record, the following is a statement of the orders placed by me for Plant and Equipment during the period of my charge of the London Arsenal Office, 1st February, 1919 to 15th July, 1921.

	No. of Items.	Actual Cost.	Estimated cost if purchased from manufacturer.
Purchased despite Treasury instructions:			
For Fuze factory.	11	1958	2826
For Laboratories.	57	5336	5336
For Shell factory.	39	1667	13160
<u>Special authorisation by Cabinet:</u>			
Transferred from A.I.F.	7	Free issue	1600
Transferred from Ministry of Munitions.	1656	167060	617095
	1832	189044	681237

It will be pardonable, I hope, if I conclude with the following endorsement upon my final report by Mr. A.E. Leighton -

"The results attained ... and the whole transaction reflects considerable credit upon Mr. Jensen, to whose initiative and energy they are almost entirely due."

DEFENCE PRODUCTION IN AUSTRALIA.

30.1.64.

Notes and abstracts mainly relating to the purchase of machines taken from the manuscript copy of a historical record on the above written by Sir John K. Jensen.

Australian Arsenal

On the 1st July, 1916 definite steps were taken for the establishment of the scheme for the Australian Arsenal and Mr. A.E. Leighton was appointed General Manager. This was the initiation of the present Government owned munitions industry in Australia.

Mr. J.K. Jensen was appointed Secretary, Australian Arsenal as from 1st April, 1918. On the 5th of July, 1918 he left for England via America arriving in England on the 2nd December, 1918 to take over the administration of the London office of the Australian Arsenal. Among the staff investigating engineering problems were Messrs. J.H. Wrigley and W.E.B. Fowler both of whom were investigating the manufacture of Q.F. ammunition. Mr. Fowler left England for Australia in 1918 and Mr. Wrigley in November, 1919.

Cartridge Case Plant

In July 1919 a cablegram from Australia was received in London asking whether preparations had been completed for the purchase of plant for the 18 pr cartridge case. The reply was that negotiations were unsatisfactory as the Ministry was retaining Birtley and the availability of other cartridges case plants was uncertain. Negotiations were proceeding.

On the 30th July, 1919 Australia was advised that the Ministry now offered a complete cartridge case plant for £20,000 and that, pending a decision, the sale by auction had been deferred.

The plant was located at Waterford, on the south coast of Ireland, Mr. Leighton asked for an extension of time and as Australia was definitely interested arrangements were made for Mr. Wrigley, accompanied by an engineer from Woolwich Arsenal, to Ireland to inspect the plant. The plant was recommended as being suitable and in a brief visit Mr. Jensen noted other machines for sale and which could be useful in Australia.

Early in October, Mr. Leighton was informed that the plant was to be auctioned on the 21st October, 1919. Approval for the purchase of case-making plant for £20,000 was received in London on the 17th October.

Mr. Jensen's first reaction was to hurry to the offices of the Ministry and to call off the auction. In fact, he was actually on the way when he decided to buy the plant at auction. He anticipated rather limited bidding. Messrs Jensen and Wrigley proceeded to Waterford to await the second day of the auction sale when the case plant was to be auctioned. Bidding was slow for the group of case machines with only the one bid for £5,000. The auctioneer disclosed that the reserve price was £10,000 and commenced offering single presses when, under almost dramatic circumstances Mr. Jensen bid £10,000 for the lot. After checking credentials the offer was accepted.

Other case machines were put up in lots and with lack of competition purchased for the sum of £510. For the sum of £10,510 18 presses and 25 finishing machines were purchased and the total quantity of machines included an additional 10 finishing machines over the machines offered by the Ministry of Munitions for £20,000. Two worn-out furnaces shown in the original offer were rejected.

To balance the Waterford plant, a 200 ton press was purchased from the Gramophone Co Ltd and also six other machines useful in cartridge making for a sum of £501. Some furnaces and accessory equipment together with dismantling, packing and costs to convey the whole of the plant to the shipping wharves brought the total cost to £13,023 a saving of nearly £7,000 over the original offer and including many items of additional plant.

It was ascertained that the Ministry of Munitions originally had three plants suitable for cartridge case manufacture. The plant at Waterford was retained for transfer to Woolwich, a second plant at Liverpool had been delivered to India. The Waterford plant which was newly new and was held to be the best of the three, was the last opportunity to purchase a cartridge case plant in the United Kingdom. An estimate of the cost of manufacturing plant to that obtained was £41,200.

The plant facilities at Waterford were poor and could not cope with heavy loads. The heavy loads caused subsidence of the floor in the plant and the mill head beds. Heavy lifts had to be made by rail to collect material for the plant but to be sent to British ports for transport to Australia.

With the additional machines a complete manufacturing unit capable of 27,000 cases per 48 hr or 4.5 inch, ball case per hour on an eight-hour shift, was obtained for a total cost of £15,021. This plant was then called upon to produce 180,000 cases annually. The process was a primitive manufacture built by the American firm of Remington.

#### Waterford cartridge plant.

The London office was originally short of funds during the year 1912 when large quantities of war-time plant was put up for disposal. In December 1912 the Australian Treasury instructed that no further expenditure in connection with the disposal was to be incurred. Requested a clarification of the position from the London office and the advance of £20,000 for the purchase of the plant by Australia. In the meantime Mr. J. J. Dawson had been instructed to the position in England and early in 1913 to get the British Government to allow some discount to Australia in the purchase of munition plant. His instructions were most protracted even reaching Cabinet level.

On the 15th September, 1912 a proposition was put to the Ministry of Munitions suggesting that the Imperial Government could dispose of the disposal of the surplus war-time munition plant at their "disposal value" of £1,000 less a discount percentage if the Imperial Government was prepared to allow a discount.

On the 14th October, 1912 the British War Cabinet decided to place at the disposal of the Commonwealth of Australia munition plant at the "disposal value" of £200,000 on which a 50 per cent rebate could be made. Australia was immediately advised and on the 21st January, 1913, ten months after the initial suggestion of bulk purchase, the Australian Cabinet accepted the offer of the British Government. Arrangements were made, although not always carried out, for disposal lists to be supplied to the London office. A large quantity of munition plant was purchased at auction and eventually the British Government stopped the Australian representative bidding at auction by cutting out the 50 per cent rebate. However, disposal lists were provided before the goods were auctioned.

During considerable negotiations the British Government arranged to dismantle and pack all items for shipment and place on the railway or means of conveyance at a cost of 10 per cent of the selling price. The British Government was able to utilise surplus labour at the factories being dismantled and the conditions were readily acceptable to Australia.

In all 1456 machines of all types were purchased on the authorised basis of £200,000 at a disposal cost of £334,120 slightly in excess of the authorised amount.

A rebate of 50 per cent brought the actual expenditure down to £167,060 and £33,302 for dismantling and packing costs.

The grand total of the machines purchased was 1633 costing altogether £1,237. This included the 62 machines on a special authorisation and most of which were purchased at auction at Waterford.