

to be written off. It need only be added that there were no difficulties in respect of acetate of Lime or acetone during World War II.

High-Explosives and Filling project

During the war of 1914-1918, the manufacture of Tri-Nitro-Toluene in Australia, as recorded in Chapter 4, was a very live subject for the Federal Munitions Committee, but only that part of it which came within the purview of the Government Factories organisation had any lasting results and it was not until the Munitions Supply Branch was established in 1921, under Mr. A.E. Leighton, that these became effective. However, the initial step was taken in July 1916 when Mr. Leighton suggested in a cablegram from London that Mr. A.A. Topp, Assistant Manager of the Cordite Factory, should be sent to England for a technical study of T.N.T. production. The cablegram was dated 28th July and some weeks later a letter dated 27th July arrived in which Mr. Leighton amplified his views on the question and suggested that a plant should be set up at the Cordite Factory for rectification of light oils from the distillation of tar. The Directors of Munitions, Messrs Leitch and Bell, who had been dealing with the Toluene matter in conjunction with the Federal Munitions Committee, supported this proposal but no immediate action was authorised by the Minister for Defence. In September 1916, Mr. Topp left for England and on his arrival there was instructed by Mr. Leighton to take up duty at the National Factory at Queensferry, Cheshire, with instructions -

Your enquiries are to be directed so as to ensure the construction and operation of a plant capable of nitrating 10 tons of Toluol per week (working one shift of 8-hours).

The total capacity required is to be provided by the operation of two distinct nitration units.

The plant is to be self-contained; that is it is to include the plant required for acid manufacture, recovery of spent acids, treatment of effluent gaseous and liquid, etc.

I wish you to treat the problem as a high-explosive one and therefore to adopt all measures that make for safety and economy of workers.

In February 1917, the Directors of Munitions renewed their recommendation for a refinery, to be on a larger scale, at estimated cost £4,000 and it was then approved and Mr. Leighton was asked to send out the working drawings for a capacity 500 gallons in 24-hours with building designs. Mr. Leighton cabled an enquiry as to the raw material to be refined and he was advised on 26th February "Trade description Benzol 50/90, quantity 500 gallons 24 hours". In March 1917, on the recommendation of the Directors of Munitions, approval was given for purchase of 10,000 gallons of 50/90 Benzol as a stock with which to commence rectification. The drawings duly arrived during the latter part of 1917 and in his annual Report of 30th June 1918 the Manager of the Cordite Factory reported that the refinery had been erected and locally constructed plant had been installed from the plans supplied by Mr. Leighton, and that "from present observations it will work well when sufficient raw material is available for steady work."

Mr. Leighton had a practice of addressing memoranda to the technical enquiry staff for each stage as it was taken up, and the following were handed to Mr. Topp on the dates stated -

18th July 1917

Will you please draw up and submit for consideration a programme for the study of:-

1. The manufacture and preparation of the explosive components and Mixtures required for the production of finished 18-pr. ammunition H.E. and Shrapnel-including; T.N.T., Ammonium Nitrate, Gunpowder, Fuze Powder, detonator composition, tetryl etc.

2. The filling of the explosive components into caps and detonators, fuzes, gages, shell, case or cartridge and primer.

3. The assembly of the several components to complete the ammunition.

Please see Mr. Bell regarding arrangements for visiting factories. I think your best course will be to make a preliminary visit to Quedgley, Coventry and Hayes. Very probably you will find subsequently that all we want is to be found at Woolwich, in which case your detailed work could be very satisfactorily carried out there.

31st May 1918.

Instructions to prepare:-

(a) General arrangement plan of Filling and Assembly shops equipped to produce the following cartridges:-

Cartridge Q.F. 18-Pr. H.E.
Cartridge Q.F. 18-Pr. Shrapnel.

The capacity of the plant to be 160,000 cartridges per shift per annum of either of the above natures of cartridge, the fuze-filling shops to be designed to fill and assemble 160,000 fuzes of either Nos. 80, 101 or 106.

The block layout of the shops giving floor area required, positions of machines and motors, gauging accommodation and all other essential requirements such as tool-rooms, stores, offices, messing and changing accommodation, etc.

The number of machines provided is to be governed by the necessity for continuity of output. To place dependence on one single machine however ample its balance of capacity is not sound practice for a Defence Factory, and is to be avoided in design.

(b) A list giving makers' names, catalogue description of and the number of machines required.

The list is to show those machines that it is necessary to purchase in England or America. It will be assumed that machines not so indicated can, if necessary, be provided by Australian machine constructors.

(c) A Schedule of labour, power, steam, water, drainage and lighting services.

In September 1918 a letter was received from Mr. Leighton,

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dated 9th July, reading as follows -

The first year of his visit was devoted to an exhaustive study of the manufacture of T.N.T. and related substances, and at a later stage I instructed him to cover the manufacture of the explosives, the filling of shells, fuzes, etc. and the final assembly of the components of complete 18-pdr. Q.F. cartridges.

He has done the whole of his work with a thoroughness that has made him a safe and reliable adviser in matters relating to the manufacture and use of High Explosives. The extent of his studies can be gauged from the reports and drawings that have been forwarded by me to Melbourne, and I feel confident that with his knowledge, in association with Mr. Brodrigg's explosives experience, the Department can safely proceed to manufacture with every promise of sure success. I strongly recommend that experimental plants for the manufacture of T.N.T., Ammonium Nitrate, and Tetryl, be assembled at an early date so that local raw material can be tried out on a small scale before we commit ourselves to the more extensive schemes compatible with defence measures. It is highly desirable that the properties of locally-made toluene, ammonia and dimethylaniline, and of the final products Amatol and Tetryl, be thoroughly investigated at an early stage. This preliminary work can proceed at Maribyrnong where the materials and the services of an expert explosives staff are available.

On receipt, this communication was marked "Seen" by Senator Pearce, which meant that proceedings could commence subject to funds being available or obtained in due course as the circumstances might require.

Mr. Topp returned to Australia on 12th October 1918 and, instead of resuming his ordinary duties as Assistant Manager of the Cordite Factory, he was attached to the Arsenal developmental staff for the duties outlined by Mr. Leighton in his letter of 9th July. On 24th March 1919, Mr. Leighton himself arrived back in Australia, and on 1st April reported to the Secretary for Defence that he had assumed charge of the Arsenal organisation and the administration of the Government Factories. On 4th April he was requested by the Secretary to submit a general Report upon the Munitions question and present

his opinions and advice thereon. The report was duly submitted on 27th May 1919, and the action taken upon it is dealt with in detail in Chapter 7. At the Cordite Factory engineering workshop he set up temporarily a plant for production experimentally of Fuzes No.80 Time and Percussion, and their filling with explosive powder. It must be explained that some time before the Armistice, when it became apparent that the War demands for engineering plant were becoming easier, Mr. Leighton obtained authority from the Department to order production plant for gun-ammunition, of which £15,640 was for Fuze manufacture and £6,200 for Filling Factories, and I added to this when I took over the London Arsenal Branch by spending another £1,958 on Fuze plant. These amounts represented the bulk of the plant for the operations under notice but only on a try-out scale, and additional equipment was obtained when the British Munitions Plant became available. On 31st March 1921, Mr. Leighton reported to the Factory Board of Administration that the first step in Gun-Ammunition production had been accomplished, and that the machining plant would be transferred ultimately to the proposed Gun-Ammunition Factory; that the explosive filling would be undertaken as a part of the proposed High-Explosive and Filling Factory to be associated with the Cordite Factory. He said that the engineer staffs, whose training has been recorded in Chapter 6, were now in position to proceed with comprehensive designs of the Factories for the respective manufactures, and recommended that Mr. A.A. Topp, Assistant Manager of the Cordite Factory be appointed Engineer-in-charge of the High-Explosives and Filling project.

Chapter 6

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On 12th May 1921, the Estimates for 1921-1922 were considered by the Factory Board of Administration and it was agreed that the

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provision for the High-Explosives and Filling project should be £43,708 for Buildings and Works and £26,894 for Machinery and Plant. Of these totals, £8,091 for Works and £10,384 for Plant were noted specifically for the T.N.T. Factory. Approval was given during 1921 for the Buildings and Works to proceed but the estimated cost was raised to £10,000. This approval was obtained in December 1921, and as matters stood at the time this was considered to be satisfactory. The progress being made in the implementation of Mr. Leighton's Report of May 1919 was slow but at least it was something in light of the implications of the Washington Conference on Limitation of Arms in November 1921, at which Australia was represented by the Minister for Defence: Senator G.F. Pearce. But it was always sure in our minds that in Cabinet Senator Pearce was a strong protagonist for self-containment whatever the Treasury attitude. Before December was out Senator Walter Massy Greene became Minister for Defence, with misgivings in Arsenal circles, as I have mentioned in Chapter 7. But these were soon dispelled by subsequent events, in particular that the Government publicly announced its policy to be the development of munitions production under a programme of expenditure of £900,000 in stages spread over six years, in which £185,000 would be allocated for High-Explosives and Filling Factories, thus providing for Buildings and Works to cost £132,100 and for Plant to cost £52,900. In the construction of explosives factories it is the practice to so spread the workshops that never in any one of them, at any given time, is any more explosive held than is necessary for a limited amount of handling, ~~and~~ Furthermore the workshops themselves are dotted about large areas of ground with each one surrounded by a roof-high mound of earth, so that in the event of

accidental explosion the blast will be prevented from affecting adjoining workshops and expend itself upwards towards the sky. The requisitions for works and buildings consequently are usually to cover a series of small buildings with their associated services: connecting tramways, air-conditioning equipment, etc. ~~and~~ it will serve the purpose of this narrative if total values only of the requisitions are recorded: the figures for 1922 being £22,135 for buildings and works and £16,000 for machinery and plant.

In August 1923, Mr. A.A. Topp presented his scheme for construction and equipment of the High-Explosives and Filling Factories according to the intentions of the 1922 Programme. It was a model of planning for Chemical factories and a copy is filed with the papers supporting this Historical Record. Similarly filed is a paper by Mr. A.E. Leighton dated 22nd October 1924 in which he discusses the manning of the Factory and suggests that under the restricted conditions of the post-war years the Cordite and T.N.T. Factories, and the Filling and Assembly Factories, the group should be considered as a whole, and that the body of employees should be employed as a single unit and moved from Factory to Factory as circumstances permitted and thus acquire a broad knowledge of all the operations. The underlying idea ^{was} being that should emergency arise there would be a nucleus of trained employees to be drawn upon to take the leadership in staffing the respective Factories as they were being brought into full-time operation. Mr. Leighton also decided that, having regard to considerations herein outlined, all the employees during the years of "nucleus operation" should be males, notwithstanding that a number of the operations of processing could quite well be performed by female

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labour. In September 1925 Mr. Leighton was able to inform the Minister that the T.N.T. Factory was so advanced that manufacture could be commenced at short notice, and that the Filling Factories were nearly complete and that they would be in use in 1926. In the light of the foregoing it is interesting to be able to record the fact that during 1931 the War Office authorities in England had become concerned about the progress being made there in reviewing the processes of manufacture of T.N.T.; that not much in that connection had been done since the termination of the War. The Australian representatives at the War Office had been asked to enquire what had been done in Australia and a report was sent advising that the Maribyrnong Factory was operating satisfactorily and that the raw material, Toluene, was being purchased from the local steel industry, but the materials for processing Nitric Acid and Sulphuric Acid were derived respectively from Nitrate of Soda and Sulphur and these had to be imported. However the Fertiliser industries held large stocks of these chemicals, and the Department carried comparatively large stocks, too, and this situation was bettered as time went on.

In the attainment of the above-stated results, there was little of a spectacular nature to be recorded. As the Votes became available in the second half of each year Mr. Topp moved steadily forward with the implementation of his programme as he had set it out in 1923. The Munitions Supply Board met every week except in holiday time and on each occasion it had to deal with several recommendations by Mr. Topp for erection of buildings or for purchase of plant. The procedure for these commencing with his instructions to the Chief Draftsman, Mr. A. Mealand, for preparation of working drawings according to

a sequence of sketch plans he developed during 1919-1922. As the sets of working drawings were completed, he discussed them with the Controller-General and, having obtained Mr. Leighton's approval, he deposited them with the Department of Works and Railways with a request for an estimate of cost. This operation was also a warning to the Works officials of a coming requisition and it enabled them to commence with their preparations. The estimate of cost having been received, a memorandum was addressed to myself applying for provision of funds and I submitted this to the next meeting of the Munitions Supply Board with a note of the Vote to which I would charge the amount. The Board having approved, a finance authority over my signature would be issued to the Works Department and to the Manager of the Factory and in due course the construction would proceed according to the arrangements made by the Works Department. The plant would be dealt with similarly except that the purchases would be arranged through the Department's Contract Board - of which, incidentally, I was Chairman. Frequently, however, Chemical plant has to be built up on the spot and in those cases the materials would be purchased and the plant constructed by the tradesman staff of the Cordite Factory under the direct supervision of Mr. Topp. To all intents the Manager of the Cordite Factory was acting as a contractor and ^{was} reimbursed out of the Vote allocated by the Munitions Supply Board for the purpose. The point I wish to make is that at no time was there a stoppage in the orderly progression of the works or in intake of plant to be installed immediately the building became available. On 30th June 1926, for example, Mr. Topp reported -

... the expenditure on buildings and works amounted to £40,000 and £29,157 was spent on plant and equipment. The new buildings started accounted for only £9,172 of the amount voted and the remainder of the sum was expended in carrying other buildings and works towards completion. ... there was no single manufacturing unit to be reported during the year as completed but satisfactory progress is being made.

Good progress is being made also in regard to the installation of plant and auxiliary services, such as water, steam, &c., and tools and gauges are being made for the manufacturing operations.

and twelve months later the position generally was reflected in Mr. Leighton's report to the Board on 18th July 1927 -

... I am satisfied that the new constructional programme at the Explosives and Filling Factories has advanced to the stage where useful work of a productive nature can now be undertaken.

and the T.N.T. factory was operated for the first time for purification of imported crude Trotyl, with the satisfactory result that a high-grade T.N.T. was produced. In 1928, the manufacture of first quality T.N.T. from Australian raw materials was commenced and successfully accomplished. The Military Board thereupon cancelled a large overseas order for projectiles filled with T.N.T. and instructed that the empty shell should be sent from England for filling at Maribyrnong. Later, the Military Board sent in for re-conditioning a large quantity of Field Artillery ammunition being held in reserve and this provided occupation and the acquisition of experience for the Filling and Assembly sections of the new factory for several years, coupled as it was with orders otherwise received for the filling of practice bombs with T.N.T. for the Air Board, filling depth charges with T.N.T. for the Naval Board, and removing Lyddite from projectiles for the Army and re-filling with T.N.T. Meanwhile, the various sections of this project were being completed and brought into production, so that in his Report for 30th June 1931, Mr. Leighton was able to say that the

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intentions of the 1922 Programme has been fulfilled at cost for Buildings and Works: £209,055, and for Machinery and Plant: £49,863. The influence upon production by the 1922 Programme will be evident from the annual statements as follows -

<u>Financial Year:</u>	<u>Value of Production:</u> £	<u>Employment</u>
1925-1926	4,778	123
1926-1927	6,969	131
1927-1928	15,360	125
1928-1929	30,749	147
1929-1930	28,519	140
1930-1931	23,919	134

It will be obvious from those figures that the employment was not proportional to the output, a circumstance common to chemical factories in that the product more or less flows through the factory according to the controls exercised by the staff operating the machinery and plant. In the earlier years also a substantial number of the employees - tradesmen and their helpers - were employed upon constructional work. It should be understood also that before 1928 the outturn was in the Cordite section only, but from thence onwards details of the High-Explosives sections commenced operations.

There was no provision for new expenditure in the 1933 Developmental Programme for the High Explosives and Filling section, but there was still a fair amount of finishing off to be done concurrently with the extensions to the Cordite section of the factory. On the other hand there was a surprisingly heavy demand from the Services and from New Zealand upon the facilities now available in the Munitions Supply organisation. The appearances were that their stocks of reserves were being overhauled and sent for reconditioning. Furthermore, the Government Fuze and Shell factories were coming

into operation and sending along quantities of the various gun-ammunition components to be filled and assembled, and made ready for firing proofs and delivery subsequently to the Services. It was all upon a moderate scale, but it meant that production was going on somewhere or other in all the Munitions Factories in enough variety at least to keep up the interest of the respective staffs and maintain technique. In the revised Programme of 1937 however provision was made ^{of} £70,000, of which £60,000 was allocated for additions to the Filling Factory for production of Fuzes and small components and the remainder to minor additions. It is explained in this connection that in the first planning for Fuzes and other Small Components, only one type of Fuze involving 22 components was contemplated, but other types of Fuzes were listed later and now the amount of components to be catered for had reached 206, with more in prospect. It meant, therefore, that three more of the large Fuze-Filling buildings had to be provided under the Works Requisition sent forward in September 1937, and other requisitions followed. Incidentally, the manufacture and storage of explosives upon the scale for which Maribyrnong was now designed demands provision of hundreds of buildings grouped in sections, to a definite plan, over an extensive area. Fortunately a possible expansion in time of war had not been overlooked in the original layout of the Factory area and the space to accommodate the three new Fuze buildings alongside the earlier building was waiting when the need came. It can be mentioned, too, that protection against lightning used to be a recurrent anxiety for explosives engineers in their planning, but scientific research between the two ~~was~~ wars demonstrated a simple solution of the problem, with a consequent reduction of expenditure: tall

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masts, bearing copper conductors, that were dotted about the factory area proved to be effective and were duly installed.

When the customary review of activities was being prepared at the end of June 1938, it was disclosed that in the components filling and assembly sections the outturn for the year was more than double the year 1936-1937. There was a greater variety of products and New Zealand contributed substantial orders. Complete rounds of ammunition for the quick^{er}firing guns of the Navy were produced for the first time, and the filling of aircraft landing flares, smoke generators and shell tracers for the R.A.A.F., all of them products new to the Factory, was undertaken successfully. Likewise the Army placed demands for specialties such as smoke mixtures, signal cartridges, rockets and star shell. With regard to T.N.T., the production was doubled as compared with the previous best year (in 1935), and also experiments were conducted with the object of establishing a process for recovery of T.N.T. from the wash waters, a practice desirable at all times if only for prevention of pollution of streams, but particularly necessary when the pressure is such that every ounce of the chemical is important.

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In the May 1939 Expansion Programme which I have recorded in detail in Chapter 7, substantial provision was made for increased production ^{at} the the High-Explosives and Filling Factories, the most notable item being £750,000 for a second complete Filling Factory, which I shall deal with in a later Chapter. With regard to increased production of T.N.T., a requisition was sent to the Works Department for erection of a 20,000-gallon tank storage for Toluene, but otherwise it was suggested by the Controller-General of Munitions Supply that the

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first step should be to send Mr. J.R. Cochrane, Assistant Manager of the Explosives Factory, to England on a mission of enquiry in respect of the operations of Explosives and Filling Factories, with a view to being informed fully on all aspects of the business as it was now being conducted in the United Kingdom. Mr. R.E. Summers, Head of the equivalent section in the Munitions Supply Laboratories, accompanied Mr. Cochrane. There was provision also in the Expansion Programme for additional Filling Capacity for Fuzes and Small Components and for Projectiles, together with the accessory Air-Conditioning plants, and works requisitions for some details of these were sent forward during December 1938 and January 1939 at estimated cost £46,425. On 15th June 1939, Mr. Leighton submitted to the Board a proposal for approach to Imperial Chemical Industries of Australia and New Zealand (for short: I.C.I.A.N.Z.) for establishment of a second T.N.T. Factory at their Deer Park works on the outskirts of Melbourne, to be financed by the Commonwealth as an "Armament Annexe" and managed as such by the Company in accordance with the established conditions for "Annexes". Further details of this project will be included in a later Chapter of the narrative.

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Footnote

General Factory Administration

It will be understood that as the individual workshops of the High-Explosives and Filling project came one by one into operation as Factory units they became subject conjointly with the Cordite Factory to the standard rules of administration and accountancy obligatory upon all the Government Factories, the exercise of which, in this particular case, devolved upon the Manager of the Government Explosives Factories: Mr. A.A. Topp. With regard to the financial aspects of the Factory

administration between the two Wars, a copy of the financial statement for the year 1938-1939 of the Government Explosives Factories is filed with the correspondence supporting this narrative, but there was so much change in everything pertaining to the operations of those factories between the years 1919 and 1939, that it is scarcely practicable, and certainly there is nothing to be gained, in taking up time and space in an endeavour to include statistics that could be of any use, other than that perhaps the following record of the investments on the respective dates shown will indicate the enormous development which took place during the intervening years:

	<u>30th June 1919</u>	<u>30th June 1939</u>
	£	£
Land and Buildings	91,813	553,897
Machinery and Plant	72,144	318,528
Stocks of Goods and Materials	167,579	319,465
Debts and Cash	<u>20,152</u>	<u>207,228</u>
	<u>351,688</u>	<u>1,399,118</u>

It will be obvious that the results possible from this increase of investment, both in employment and in production, would be incalculable should we have to face war. In fact that was evident from the returns on account of 1938-1939, whereas in 1936-1937 the value of production was only £73,187 it had become £243,447 for 1938-1939, and the employment compared thus

	<u>Average</u>
1923 to 1933 when it ranged 64 to 158 persons	124
1934 and 1935 when it ranged 213 and 281	247
1936 to 1938 when it ranged 349 to 488	420
1939	1,086

There were only fifteen female employees at that time. It was a matter of course prior to the War that male labour exclusively

would be employed in explosives manufacture, but that had to be relaxed later in some of the operations. The expenditure upon salaries and wages was mounting also as war became imminent; It was £162,218 for 1938-1939.

It will be obvious that the planning and the operation of an Explosives Factory, not at any time a commonplace in industry, becomes a matter of high responsibility when production of military explosives is the objective, depending as it does upon the capability of the men in charge, particularly as the records over the years of the Government Explosives Factories show them to have been successful in their management. I think, therefore, that it is due that the names of the men concerned should be placed on record, and it will be opportune to do that now. The story opens with Mr. C. Napier Hake, Chief Inspector of Explosives in the State of Victoria, who was Adviser also to the Department of Defence during the period 1904-1909 in respect of establishment of an Explosives Factory as part of the Defence organisation of Australia. On Mr. Hake's advice, Mr. A.E. Leighton took up an appointment in January 1909 as Manager of the proposed Cordite Factory and to be responsible for its design, construction and operation, which he successfully accomplished and carried on until 1916. Then he accepted appointment as General Manager of the proposed General Arsenal which, as its name indicates, was to be responsible for the procurement and production of all the War Materiel considered to be necessary for the Defence of Australia.

One characteristic for which Mr. Leighton was notable was his extraordinary aptitude for selection of the right men to be his immediate assistants. One example of this is to be found

in Chapter 6 of this narrative and other names to be mentioned include the following early appointments to the Explosives Group of factories -

Mr. N.K.S. Brodribb, who joined Mr. Leighton in October 1909 as his First Assistant.

Mr. A.A. Topp, joined December 1912 and Mr. A.G. Hall joined March 1915 as Second Assistants.

Mr. J.R.S. Cochrane, who joined in August 1915 as a Chemist.

Messrs C.W.O. Stubbs and S.C.B. Abbott, who joined in January 1919 as Chemists; and as our writing progresses

we shall see more of them but it can be said here that when Mr. Leighton accepted appointment in 1916 as General Manager of the Arsenal, Mr. Brodribb took over management of the Cordite Factory, and the Assistant Managership devolved upon Mr. Topp until soon afterwards he went to England in connection with the High-Explosives project and then Mr. A.G. Hall acted as Assistant Manager. This continued until 1921, Mr. Topp being preoccupied throughout with the development of the High-Explosives and Filling side of the factory, when Mr. Hall was confirmed as a second Assistant Manager for supervision of the Propellants section. During 1921 also, Mr. Brodribb's overall status in the Arsenal organisation was emphasised by his designation as Chief Chemical Engineer in addition to being Manager of the Explosives Group of factories into which the Cordite Factory was being integrated. During 1923-1924 this Group of factories, including the High-Explosives and Filling Factory developmental project, were brought within the administrative organisation set up at Maribyrnong under Mr. Brodribb as Chief Executive Officer, but the new projects had so progressed that in 1926 it was decided that Mr. Brodribb could be relieved of the details of management of the Explosives factories; that it should be entrusted to Mr. Topp as "Works Manager" with

Mr. A.G. Hall as First Assistant Manager; and that Mr. J.R.S. Cochrane should be promoted to ~~the~~^{be} Second Assistant Manager. These arrangements enabled Mr. Topp to devote the greater part of his time to the developmental activities, which continued up to the outbreak of War, while Messrs Hall and Cochrane concerned themselves with the managerial functions suitably divided when a group of factories is placed within one administration. In May 1936, Mr. Brodribb was withdrawn from the Maribyrnong Administrative office, for special duties which involved a tour of duty abroad with a view to investigation of developments in munitions production consequent upon the international situation, and having in mind also that shortly he would be succeeding Mr. A.E. Leighton as Controller-General of Munitions Supply on the latter reaching the age for retirement. Mr. Brodribb was absent 16 months during which time he was attached for duty to the Delegation for the Imperial Conference of 1937 and he returned to Australia in September of that year. He became Controller-General on 2nd November 1937 but on 2nd May 1938 he was detailed for special duties as Inspector of Works and Services and Mr. Leighton was recalled from his retirement to be Acting Controller-General and Acting Chairman of the Munitions Supply Board. It can be added that when the Administrative functions of the Maribyrnong office were terminated with the departure of Mr. Brodribb, the responsibilities of Mr. Topp as Manager of the Explosives Group of Factories were exercised directly under the administration of the Munitions Supply Board.