

Chapter 8 - The Explosives and Filling Factories -

1919-1939

When this Chapter opened in 1919, the Government Explosives Factory Organisation consisted of the Cordite Factory at Maribyrnong, Victoria, a going concern still but commencing to ease down, and the Acetate of Lime Factory at Brisbane facing an uncertain future. During the twenty years covered by this Chapter, the strengthening of self-containment in Australia in regard to Military Explosives necessitated large additions to the Government Explosives factories, both in extensions to the works and in the variety of products to be handled, so that by 1939 there was a large group of Explosives Factories in existence. We are obliged therefore to arrange our recital to record first the doings of the existing Cordite Factory, which as its name implies was established for manufacture mainly of the propellant explosive used in military ammunition, and its expansion during the period under review into manufacture of other varieties of propellants, ~~and~~ that will be followed by some paragraphs relative to the liquidation of the Acetate of Lime Factory at Brisbane, and then finally there will be the story of the introduction into Australia of the manufacture of High-Explosives and of the provision required for loading these into the projectiles and the assembly of all the components of gun ammunition in a Filling Factory. This second section will be headed "High-Explosives and Filling project".

Cordite Factory

For some time after the War ended the production of Cordite was continued upon the war-time scale. I do not know how long I was in England at the time. Probably because it was

customary practice to keep replacing the Cordite being issued for .303-inch ammunition manufacture, but manufacturing ceased in December 1920 for six months and then was resumed at a rate of 10,000 lbs. monthly, subject to stoppage again should manufacture of .303-inch cease. This was discouraging to the administration, but on the other hand certain investigational work undertaken in the Factory laboratory was a stimulus to the management and scientific staff, and an indication that the termination of the War was not the end of everything that was interesting. The Factory Board of Administration was asked by the Air Board in 1920 for advice and assistance in connection with a deterioration of portion of a stock of clear Cellulose Acetate Dope manufactured in England which had come to Melbourne as part of the British Government's post-war gift of aircraft and accessories. The "doping scheme" of the time for aeroplanes provided that four coats of cellulose acetate should first be applied to the fabric, and that a protective covering of two coats of nitro-cellulose varnish pigmented with yellow ochre and carbon black should be laid over that, and The Air Board requested that a replacement quantity of the unserviceable cellulose acetate, and the full requirement of nitro-cellulose covering, should if possible be manufactured in Australia and thus assure regular supplies of both for R.A.A.F. purposes. The experimental work was carried through to production on a laboratory scale with successful results and provision was made in the Estimates for installation of a manufacturing plant. A Requisition for an Aeroplane Dope Preparation building to cost £3,015 was sent forward to the Works Department in December 1920, and purchases of plant estimated to cost £4,000 were

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arranged through the Contract Office. Another useful service undertaken during 1921 was to commence preparation of a quantity of T.N.T. charges, and manufacture the Exploders, for use in submarine blasting operations at Port Phillip Heads whereby the rocky sea bottom would be lowered to enable admittance of deep-draught steamships into the Port of Melbourne. The 300 tons of explosive was surplus war stock imported from England by the Victorian Ports and Harbours Department, and a certain amount of preparatory work in the way of melting and casting had to be done under the supervision of the State Chief Inspector of Explosives before the explosive could be used for the purpose stated.

In December 1921, Mr. Leighton commenced raising questions as to how far it was intended to go in laying in reserves of .303" ammunition and the constituents, particularly Cordite. He suggested discussion with the Military Board and that the Minister should be advised. In another memorandum, relating to the Small-Arms Factory, he said -

There appears to me little justification when funds are limited to continue spending so large a proportion of our grants on small-arms ammunition and rifles, when so many other essentials are lacking.

and while there is no record of the facts, it can be imagined that it was these papers which influenced the recently appointed Minister for Defence (Hon. W. Massy Green) in the institution of the Munitions Development Programme of 1922. As to the specific questions raised by Mr. Leighton, the Board decided at its meeting of 15th December 1921 that having regard to the manufacture of .303" small-arms ammunition at Footscray for the financial year 1921-1922 being fixed at 30,000,000 rounds, the production of the Cordite and Acetate of Lime factories would be so reduced as to maintain reserve stocks that

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they would never exceed 850 tons of Acetate of Lime and 235,000 ^{lbs.} tons of Cordite M.D.T. 5-2. Managers were advised accordingly but the plan had been scarcely put into effect when under the 1922 Programme there had to be a further reduction - the Factories being placed upon a nucleus basis - and the output of .303" small-arms ammunition was fixed at 3,000,000 rounds per annum. Mr. Leighton discussed the effect of this upon the Cordite Factory at the Munitions Supply Board meeting of 23rd March 1922 and explained the danger of operating it under a "stop and go" system to suit intermittent demands - unpractised labour would have to be used in such circumstances. He suggested the manufacture of small-arms ammunition Cordite should be completely stopped after June 1922, and that the reserve stocks should be drawn upon until they became so low as to warrant the factory being started up again on full production. As the reserve stock would reach 240,000 lbs. by 30th June 1922, sufficient for 40,000,000 rounds, it would be obvious that resumption of full production need not be considered ^{for} some time to come provided the cordite remained in good condition while being held in store. As to the latter he said that while the Service life of bulk cordite could be fairly assumed to be 12-14 years, there would be periodic checks to determine whether stability was being maintained. The main effect of the reductions was in regard to employment. In July 1921 that amounted to 151, including salaried staff, and it had dropped to 122 in January 1922, but by June 1922 it was about 76, and they were employed on various developmental activities. T.N.T. manufacture and filling, Toluene refining and Aeroplane Dope manufacture, and new manufactures connected with the gun-ammunition programme such as the experimental work

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of filling gunpowder into sample fuzes, ~~so that~~ there was sufficient work to keep the reduced operative staff in explosives practice, and the care and maintenance staff in new plant construction and installation. The Factory nevertheless had little to offer as a free issue under the scheme devised for operation upon a "nucleus basis"; Such cordite as it was able to produce under the intermittent system of working was made available free of charge to the Ammunition Factory for manufacture of small-arms ammunition, and later aeroplane dope also became available to the R.A.A.F. as a free issue at the rate of about 1,100 gallons per annum, but very little otherwise could be done by that Factory for the Services.

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About this time, as the manufacture of Cordite had practically ceased, with the exception of a small quantity required in the manufacture of pistol ammunition, and ^{as} the Factory was producing other explosives as well as cordite, it became known officially as "The Explosives Factory, Maribyrnong", or "E.F.M." for short (even though many of us through custom would still revert to the old familiar "Cordite Factory"). The limited key staff, however, was found employment in a variety of tasks of a nature similar to those already indicated, and some exploratory work was done in the manufacture of smoke bombs and other pyrotechnics, and alcohol was rectified for special purposes such as ^{for} the Serum Laboratories and Public Hospitals. The Aeroplane Dope section was also in full working in the supply of dopes and coverings of various natures to the Royal Australian Air Force and the various Civilian Aviation Companies of Australia. Furthermore, in that connection, Mr. Leighton suggested to the Board in November 1924 that the cellulose nitrate used for aeroplane

dope was adaptable to the preparation of patent leather dressings for which there appeared to be a lively demand but which now was being imported. He said that firms had been enquiring as to the possibility of nitrocotton for leather dressing being made up at the factory and proposed that two tons should be made up with a view to ascertaining the possibilities of a local demand; it turned out to be successful and useful quantities were sold. In 1926 the Air Board advised that increased supplies of Aeroplane Dope and Coverings were being required: 3,700 gallons in all to cost £4,493 was the estimate for 1926/1927, and later it was advised that about 4,950 gallons would be ordered for 1927-1928. It enquired also whether any of these orders would be supplied free of charge under the "nucleus production" scheme, and was advised that they would be continued at the rate of 1,100 gallons per annum. An interesting interlude in connection with the nitro-cellulose section, was a request by a well-known Melbourne paint manufacturer that Mr. J.R. Cochrane, Chemist-in-charge of the Paints and Lacquer section should be permitted to act as a consultant. They explained that he was the only person within their knowledge possessing the qualifications and experience. The Board agreed. Its viewpoint was -

that local production of these materials be encouraged as much as possible, and thereby make an addition of potential value to the country's chemical industry.

In May 1927, an order for Cordite was received from the New Zealand Government. It was a strictly commercial transaction. There was nothing sentimental about it. The first enquiry was received in November 1925 and 4/6d per lb. was quoted but decision was long-delayed as shown. It can be presumed that enquiries were made elsewhere before a conclusion was reached.

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Actually there was no charge for profit but certainly any additional quantity manufactured contributed relief to the overhead charges in Factory operations. During October 1928, Mr. Leighton visited New Zealand at the invitation of the Government and discussed the possibilities of Australian Munitions production with the authorities there. His conclusions were reported in a few words: "The Department would consider it a matter of necessity and duty to continue buying munitions in the cheapest market". However a proposal for a five-year agreement for supply of its requirements of Cordite, at 4/6d. per lb., was received from the Government of New Zealand in January 1929 and duly confirmed.

At the instance of the Military Board there was a revival of interest in cordite manufacture in 1928 when attention was drawn to the state of the reserve of M.D.T. cordite for .303" ammunition which had fallen to a quarter of the accepted quantity because of drawings by the Ammunition Factory. This had to await the availability of funds but manufacture was resumed in 1930. ~~and~~ Meanwhile consideration was given to the age of some of the existing reserve stocks and, while (it was agreed) the stability was still remarkably good, ^{that} any ammunition made for reserve stocks or for New Zealand should be filled only with cordite of 1928 manufacture or later, and that the older cordite should remain in stock as long as it was reasonably safe to hold it. The idea ~~being~~ ^{was} that it could be used up for any requisition calling for cartridges that would be fired soon after making up, such as blank practice ammunition. Reviewing generally the operations of the Factory for the ten years following the termination of the war, the products included Acetone, Cellulose Acetate, Acetic Anhydride and Glacial Acetic Acid. The Royal Australian Air Force having

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pigmented acetate and nitro-cellulose, large quantities of these coverings, as well as other dopes and identification colours were supplied for Service purposes and to the commercial aircraft companies. Other activities included the recovery of waste alcohol during the process of manufacture of Insulin for the Commonwealth Serum Laboratories; the manufacture of twenty-nine (29) varieties of special lead-free paints and enamels; and the supply of glycerine mixtures, soap mixtures, pitch composition, drawing paste, lacquers, varnishes, lutings and cements. Production was maintained in the Acid and Guncotton sections and 2,000,000 pounds weight of Acids were produced or treated annually. Other manufactures were Nitro-Glycerine, Guncotton, Nitro-cellulose and a De-coppering solution. Cordite was produced intermittently in the Propellants section and in the Pyrotechnic section the products were Smoke Candles and Smoke Floats, and also the section was called upon to design a special wind-indicator device required by the late Squadron-Leader Kingsford Smith to be used on the sea. The Small Components section, too, was satisfactorily active. In one year 86,000 articles were supplied, including paper bomb-cylinders, paper tubes for shell-exploders, discs of millboard and felt-cloth and batiste, and fuzes were repaired and re-conditioned. There was variety in the experimental work, typical instances being treatment of Queensland Cotton linters for guncotton production, dehydration of nitro-cellulose pulp by means of alcohol, use of Linseed and Tung oils in lead-free gloss paints, substitutes for Benzol in aeroplane dopes, etc. A study was also made of the effects upon the health of employees in their contacts with T.N.T. Steps were taken by means of observation and periodical examination to eliminate the risk. Suitable clothing, baths and advice regarding personal

hygiene were provided, and it was decided, when the volume of production became appreciable, to permanently attach a medical officer to the works in conjunction with the Commonwealth Health Department's Division of Industrial Hygiene. So much for the ten years following the termination of World War I. It is only a brief survey of the activities of the Government Explosives Factory during that period, but it indicates that the factory was far from becoming moribund when it was reduced to "nucleus production" and a "care and maintenance" basis. It will be evident that the limited amount of finance allowed had been spent judiciously and that the scientific and technical staffs had been kept well up to key pitch. It was not until War broke out in 1939 that the merit of what had been done by the staff of the Explosives Factory during the lean years became fully apparent. It was noticeable that they had a remarkable range of chemical processes at their finger-tips when they had to face the requirements of "total war" and this paragraph shows how that came about.

During the financial stringency of the Depression period, there was not much call upon the factory from the Services but it carried on fairly well with the aid of commercial demands for chemicals ordinarily available from imports but now being restricted. The fact that we had to make up for our own purposes various products of commercial usage, such as paints and lacquers, attracted enquiries from merchants as to their availability for civilian needs. There was nothing spectacular in the transactions but an approved sales list of the time illustrates the variety -

Dopes and Coverings
Identification Colours
Acetone Solvents
Leather Dressing
Collodium
Nitro-Cellulose
Lead-free Paints and Lacquers
T.N.T. Charges
Sulphuric Acid
Salt Cake

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In 1931 there was an approach by an entirely Australian merchant firm to manufacture Oil of Mirbane (Nitro-benzene) to their order at a profitable price. This chemical originated in the course of working up to the manufacture of aniline dyes from coal tar. It was noted that nitro-benzene smelled remarkably like oil of almonds and was used as a substitute for that oil in perfuming toilet soap and for commercial purposes was given the name "Oil of Mirbane". As a basis for aniline it is now used for a variety of chemical products, dyestuffs, pharmaceuticals, etc. and was being imported by the local merchants for Australian soap and polish makers. The basic materials for Nitro-benzene and Trinitrotoluene are Benzol and Toluene respectively - both of them being by-products of the coke ovens at Newcastle and Port Kembla - and the ability of the Cordite Factory to process these further thus afforded a market for products which otherwise would have been difficult to sell. The output of Oil of Mirbane gradually increased from a small beginning to 187,053 lbs. for 1934-1935 - a satisfactory production it was thought, but that was easily capped by the 271,859 lbs. sold in 1937-1938. Another interesting contact with the business world related to the utilisation of the cotton-waste treatment plant of the Cordite Factory for cleaning the raw cotton from which is produced the common cotton-wool purchased at the local pharmacy. Later the Australian firm joined up with an English company, and in 1933 this combination signed an agreement for three years

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whereby the Explosives Factory was to instal plant and undertake further operations in the production of cotton-wool amounting to 150-300 tons. The agreement was carried on successfully until the latter part of 1934 when the Company asked for permission to terminate the contract with a view to establishing its own works except that for some years the Cordite Factory continued operating the cotton-waste treatment plant owned by the Commonwealth but that arrangement, too, was terminated before the outbreak of war. The Munitions Supply Board had no objection to cancellation of the agreement. It was pleased to have been of assistance in having another industry of Defence interest soundly established in Australia. There was also occasion during 1934 to consider the question of continuance by the Explosives Factory of commercial trading in Lacquers, Solvents, etc. Representations were made by the Metal Trades Employers Association of New South Wales that an Australian subsidiary of the leading British manufacturer was in a position to supply many of those products, and accordingly instructions were issued to the Manager of the Factory that applicants for supply of such goods were to be referred in the first instance to the manufacturer named.

The principal interest of the Explosives Factory from 1932 onwards was centred in the question: "Whether it was desirable or necessary to set up Australian manufacture of a new variety of Cordite for particularly Naval purposes recently developed in the United Kingdom". In the course of preparations being made at Maribyrnong for manufacture of a known type of Naval Cordite (M.C. Cordite), certain enquiries relative to processes were referred by the Australian Navy Office to the Royal Navy in England and these elicited a

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course of development there should be preferred. Technical reasons were given why but it will suffice for this narrative if I say that this latest type, (known as Solventless Cordite - "S.C." for short) was better in respect of its explosive and keeping qualities, cheaper to manufacture, and the use of acetone as a solvent was eliminated. This latter ^{was} very interesting to the Australian factory because of the difficulty in obtaining ^{all time} it and its cost. The Royal Naval technical officer who was consulted wrote -

I have, as a matter of fact, discussed this aspect with the Manager and Assistant Superintendent here and I think there can be little doubt that if you installed a small scale S.C. plant, the saving ⁱⁿ cost of manufacture would pay for the initial outlay quite easily within a very short time of running.

It was suggested that a representative of the Munitions Supply Board should visit England to obtain first-hand information. The Board considered this on 25th August 1932 and in drawing it to the Minister's attention said -

... it is strongly of opinion that steps should be taken early to bring the manufacture of Naval Cordite (S.C.) and other approved explosives into Australia. The need for that particular work and for a periodical survey of munitions practice in England is obvious, and the Board recommends that approval be given for a visit to England by the Controller-General.

The Minister duly approved and Mr. Leighton left for England on 31st January 1933. At the beginning of April, Mr. Leighton cabled for £6,000 to be made available for purchase of plant for the new factory and he also gave details of the buildings and plant required and estimated the total cost as being £40,000. The £6,000 was duly approved and the general proposal was referred to the Naval Board and the Defence Committee for their information and consideration. Subsequently in December, the 1933 Developmental Programme, was launched and included in it was £40,000 for the S.C. Cordite project,

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but when Mr. Leighton returned to Australia in February 1934 the whole of the 1933 Programme had to be revised and re-planned, and the cost of the S.C. Factory would now be £100,000, the reason being that whereas, at the time of his cablegram from England, only Naval requirements of S.C. Cordite were being contemplated, the use of that type of Cordite was no longer confined to the Navy. An Army demand had to be met for Coast Defence guns and for the Anti-Aircraft guns being introduced into the Services. Two other types of Cordite were also being introduced all of which would require nitro-cellulose in place of guncotton as the major component. The changes meant a new nitro-cellulose factory throughout, a large addition to the acid factory and a modernisation of the whole propellant factory. The cost would now be £65,000 in all for Works and Buildings (£26,100 being already commenced) and £35,000 for Plant. Incidentally, a contribution from the Vote for Unemployment Relief was applied towards the cost of these works during 1934-1935.

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In February 1934, the Air Board warned the Munitions Supply Board that it had decided upon a reversion to nitro-cellulose dope to be effected gradually as the stocks of cellulose acetate dope and materials held by the Explosives Factory became exhausted. The Controller-General of Munitions Supply said that he considered the decision to be wise but as incidentally it meant abandonment of production plant which could only be got together again at great cost - he had in mind the Acetate of Lime Factory at Brisbane and the Acetone plant at Maribyrnong - he thought it should be considered by the Defence Committee before presentation to the Minister. The cessation of manufacture of cellulose acetate was duly confirmed by the authorities named, and thereafter nitro-cellulose dope only was manufactured; this being facilitated by the additional

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it was decided in 1938 that owing to the heavy demands for nitro-cellulose in manufacture of the various types of cordite, the production of dope for Aircraft purposes in the Explosives Factory would be gradually decreased and that all concerned should be advised to obtain their supplies from the now well-developed commercial sources.

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In 1937, as shown in Chapter 7, Ministerial instructions were received for a revision of the 1933 Programme, and the Munitions Supply proposals were considered by the Board on 3rd August. As the Controller-General had already brought to the notice of the Board, and subsequently to the Minister, certain increased expenditures necessary in respect of the S.C. Cordite project, - to produce 100 tons annually against the 50 tons originally designed - and in the Filling Factory to be referred to shortly these were included in the £194,000 requested in addition to completion of the proposals of the 1933 programme. The new Buildings and Works were estimated to cost £124,000 and the Plant and Tools would be £70,000, the latter being of great variety to suit the manufacturing operations to be performed in the respective buildings. The report to the Minister included the following extracts -

The proposals for the (original cordite section of the) Explosives Factory include additions for an increased output of Propellants which includes the items of S.C. Cordite, Cotton Treatment, and the Acid and Guncotton sections. Portion of the Acid section also contributes to the manufacture of T.N.T. The additions to the Pyrotechnic and General Chemical sections will facilitate an extended use of the existing equipment, and the remaining items are necessary to the manufacturing extensions.

The estimate of expenditure for this group was £72,000, of which £16,000 was for S.C. Cordite section and £29,000 for Acid section.

For the High-Explosives and Filling Factory, the important expenditure relates to the equipment for filling large Air Bombs and for filling and assembling Fuzes, Primers and Gaires, a condition which arises because of the variety of these items for Gun Ammunition and other small components which have now to be produced as compared with the few types formerly used with 18-pdr. and 4.5" ammunition.

The expenditure for this group will be about £70,000 out of which the Fuzes and Small Components section will require £60,000.

So far the funds allotted (in the Development Programme) have not enabled the erection of Inspection buildings, but the manufacturing buildings being used temporarily for inspection purposes must be vacated on an extended programme. Special Inspection buildings must therefore be provided at estimated cost £12,000.

With reference to Magazine accommodation, at least ten magazine buildings must be provided as holding places for manufactured explosives pending loading into shell and cartridges, and while awaiting proof, etc. The State Government has requested that its explosives magazines which have served over many years should be vacated because of being required for commercial purposes. It is necessary also that the Military magazine area at Maribyrnong should be vacated in order that the Ammunition Factory can utilise the land, and in consideration of such transfer it is proposed that the Munitions Supply Board should provide a Military magazine on a new site. These items necessitate provision of £40,000.

As regards the High-Explosives and Filling Factories and the Inspection Branch, reference will be made elsewhere to these projects, but the steps taken in respect of Magazine accommodation in connection with the Cordite and Small-Arms Ammunition production can be included here. This question had been a subject of concern for many years, but the restricted availability of finance forced the Defence Department into various shifts in the way of improvisation until in the 1930's the position became critical. However, the revision of the 1933 Developmental Programme afforded an opportunity for obtaining a Vote, and due advantage was taken as shown. The intention ^{was} being to build additional magazines on the Truganina Magazine area: a reserve of over 24 acres in the western outskirts of

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Melbourne facing Port Phillip Bay at the beach known as Altona Bay. This was the "explosives anchorage", and a jetty there is connected with the Magazines by a small tramway. The reserve was set apart in 1897 as a Defence Magazine area but it remained in ownership of the State of Victoria and became used under its auspices for storage of commercial explosives, the Defence portion being leased to the Commonwealth on a peppercorn rental. When the approach to the State Authorities was made they suggested a monetary rental and intimated also that, as the accommodation already in State control was insufficient for commercial demands, the accommodation occupied by the Commonwealth should be vacated for State purposes and that Defence magazines should be built elsewhere. The inference ^{was} ~~being~~ that otherwise a more substantial rental should be paid. Nearer Melbourne there is another magazine area adjoining the Footscray Ammunition Factory known as the Maribyrnong Magazine, which was occupied jointly by the Army and the Munitions Supply Board for many years, and an approach was made to the Army that the military explosives there should be removed to new magazines which the Munitions Supply Board would provide at Truganina, leaving the Board solely in occupation at Maribyrnong. As the Navy and the Air Force were also interested, the matter was remitted for consideration by a ~~branch~~ interDepartmental Committee and it was agreed that, as Ministerial approval had been obtained for purchase of 480 acres of land in the Truganina district to be known as the Derrimut Explosives Reserve, ~~and that~~ all Defence explosives in bulk should be stored there. Further ~~that~~ the Army should vacate the Maribyrnong Magazines and leave them for storage of Munitions Supply transit explosives such as Cordite for the

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Small-Arms Ammunition Factory, filled cartridges waiting for transfer to the Services, and the like. It was further agreed that ^{as} ~~in~~ most of these arrangements were made to meet the purposes of the Munitions Supply Board, its Votes should bear the bulk of the expenditure amounting to £61,000. It was further agreed that the Army would assume the caretaking of the Derrinut Magazine area and that the Munitions Supply Board should be responsible for ^{taking} charge of ^{the} Maribyrnong Magazine.

Another accessory for the Explosives Factory which became practicable under the 1937 programme related to proposals made by the Manager that he should be permitted to set up within his own organisation a small plant for maintenance of the precision tools and gauges of which there was a moderately substantial requirement since the Factory became equipped for production of Small Components and their filling with explosive chemicals and assembly. When the Factory was concerned only with actual manufacture of explosives, ~~such~~ tool-making and repair as required was undertaken in the Ordnance Factory toolroom - to all intents the work was sent out to a contractor, a procedure which always has its disabilities, ~~but~~ in recent years the demands for new tools and for repairs had increased to almost daily, and he urged that the conditions current warranted establishment of a Toolroom to be operated under his own supervision within the Factory area. When the Board discussed the matter it was agreed that the proposal could be justified as soon as funds could be provided, especially as it was known that the Ordnance Factory was being hard-pressed at the time, and it directed that Mr. J.D. Statton, Assistant Manager of the Small-Arms Factory, an experienced toolmaker, of international standard, who was acting in a managerial capacity

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in a Melbourne factory at the time, should assist the Manager of the Explosives Factory in drawing up a scheme. This was done, the estimated cost of equipment being £3,000 and the staff suggested being two toolmakers and an apprentice, and The Board approved in November 1938.

There was opportunity also to give increased attention to the facilities affecting the safety and welfare of the employees, and funds were obtained from the Votes under the 1937 Programme to provide for an amenities block of space and equipment adequate for a factory of the size and importance now attained by the Government Explosives Factory. It is a rule that the employees of any Explosives Factory must leave the factory buildings when not actively engaged in their duties, and in no circumstances whatever is any person, from the Controller-General of Munitions Supply downwards, (or any visitor) allowed to bring smoking materials into the factory. They must be deposited at the factory gate. Consequently there must be some place where meals and recreation can be taken. At a convenient situation outside the factory fence there was provided a mess room, to accommodate 500 persons at a time - with meal, smoking and other facilities. Another requirement which has to be provided for, is that the garments worn by the employees working in the controlled workrooms of an Explosives factory must be scrupulously clean, and that those persons actually in contact with the explosive materials must also wear specially-designed clothing. The remaining employees of the Explosives Factory, and in all other of the Government factories, too, are provided with two suits of overalls to be worn alternately during working hours. This involves laundry arrangements, and equipment for that purpose is installed at the

Maribyrnong Explosives factory - including drying and folding rooms to ensure independence of the weather. During the year 1938-1939, 178,096 articles were handled in the laundry, inclusive of items sent in from the other Departmental factories.

It is convenient here to interpolate a matter which at one time attracted the attention of the Auditor-General of the Commonwealth, because of its general interest and for guidance should the question ever be raised again. In December 1923, the Secretary of the Department of Defence received the following communication from the Auditor-General -

Your attention is invited to the following extract from an Audit report upon the accounts at the Acetate of Lime Factory.

'During the examination it was observed that flowering plants, seeds, &c., amounting to £20 and two lawnmowers costing £26 were purchased during the year. Other implements purchased for gardening purposes are taken on Stores Charge and issued to "Maintenance of Grounds" as required. It is understood that much of the time of two labourers is taken up attending to the gardens, lawns, &c. which are stated to be extensive and picturesque. The idea of beautifying the grounds adjoining the factory is commendable but from a commercial point of view it might be considered whether the expenditure incurred is justified'.

Similar expenditure has been incurred on flower gardens, lawns, gardening implements &c., at the Cordite Factory.

It is desired that this Office be informed whether competent authority has been obtained for this expenditure at these Factories.

The Munitions Supply Board suggested that the Auditor-General should be informed -

.... that it is the opinion of the Board that it is necessary from a technical standpoint that as far as possible the surroundings of Munitions Establishments should be protected against dust and mud. While this is the principal reason for laying out lawns in the vicinity of the Munitions Establishments it is generally agreed amongst authorities on factory management in England and America that it has a beneficial effect upon

employees if the surroundings of their work places are made as attractive as possible particularly in Establishments where higher-grade processes are carried on. The Board therefore authorises the expenditure incurred, but will be prepared to further consider the matter at any time the Auditor-General feels that the expenditure might be more than the circumstances warrant.

Other considerations were also in mind when this Minute was drafted but they were not brought in because it was felt that a stand should be taken on general principles and that special cases should be dealt with separately. It can be explained here, however, that, in explosives manufacture, many of the operations have to be carried out in controlled temperatures and also that the elimination of dust is an absolute necessity. Where practicable the workrooms are air-conditioned, but also, as a means of reducing dust and as well minimising the risk of fire, lawns and grassed areas are laid out and trees and shrubs are freely planted. Likewise the protective mounds surrounding the explosive houses are planted with creeping vegetation to obviate erosion by wind and rain, and further, as a means of avoiding grass fires - mowing machines cannot be used because of the numerous buildings and fences dotted about - flocks of sheep are maintained to keep down the growth. Originally, the factory area was leased to stock and station agents for grazing sheep, but in 1932 it was decided the leases should not be renewed, and that instead the Department would run its own sheep on the land, mainly to obtain a better supervision of the stock in carrying out the objectives: one of which was to ensure the grass being closely cropped, and the other to prevent the animals straying into unwanted areas. It was expected that the revenue being obtained from the grazing leases would be offset by breeding and marketing the sheep as on a farm, and shearing machinery with yards and dipping pens

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were installed with satisfactory results; The accounts for the three years 1934-1935 to 1936-1937 showed the total sales averaging £861-17-8 per annum made up by sales of Live Stock: £688-16-7 per annum; and Wool and Skins: £173-1-1 per annum.

In October of 1938, following upon the Munich episode, there was a call for a further revision of the Development Programme, in reply to which I advanced considerations that delayed formal Cabinet approval until September 1939 when it became known as the May 1939 Developmental Programme. However, all of our proposals for capital expenditure from October 1938 onwards were related to the new Expansion Programme and consequently they were approved by the Minister in that light. The Expansion Programme included £50,000 for a greatly increased production of Cordite and the first works requisition on that account, amounting to £8,250, was sent forward on 21st December 1938 - in anticipation of the Vote. The factory report for the period immediately preceding the outbreak of war shows that manufacturing was being carried on at an increased rate, whereas the value of production during 1936-1937 was £73,187 it attained £243,447 for 1938-1939; particularly it was the Naval Cordite and the Cordite for .303" ammunition that built up the output and also the daily production of T.N.T., which had been quadrupled, contributed. In the Acid section, Nitric Acid and mixtures of Acids for various purposes had reached quantities running up to several million lbs. a year, and the output of Guncotton for Military purposes, demolitions, etc. received special attention; All this called a heavy stocking-up of Materials and Supplies, the value of which had reached over £200,000 on 30th June 1939; It was felt that with this the Factory was well fitted to meet all calls particularly in

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Acetate of Lime Factory

In 1937, the Acetate of Lime Factory, was liquidated, and, as it was an adjunct of the Cordite Factory, the circumstances can be explained here. As recorded in Chapter 4, it was a necessity of the War of 1914-1918, established on the Brisbane River at Bulimba, Queensland, to ensure that Acetone, a constituent in the manufacture of Cordite, would at all times be available from Australian raw materials such as Molasses, a by-product in the refining of sugar, large quantities of which were obtainable from the canefields of Northern Queensland. The plan was that the Molasses would be conveyed by rail to the port of Cairns and deposited in a bulk storage tank set up on the waterfront, and thence pumped into tank steamers for conveyance 1,000 miles to the Acetate of Lime Factory at Bulimba. At the Factory the Molasses would be converted into Calcium Acetate (Acetate of Lime) and then bagged for shipment to the Acetone Factory at Maribyrnong. The capital expenditure upon the enterprise up to 30th June 1919 was £120,612, but the factory only commenced processing on 2nd September 1918, one month before the termination of the War, so that it never had opportunity of proving itself in the War effort, except that having produced Acetate of Lime to the value of £25,529 in the first nine months of the full operation, there was indication that it might have been profitable if a full market for the product could have been maintained. In the year 1919-1920 it was decided to utilise portion of the molasses for manufacture of alcohol, which also was used in the production of cordite and other manufacture and a discontinuous still comprising an analyser and a rectifier was installed. The production of alcohol commenced in January, 1920, and 22,206 gallons were produced by June. During this year

the output of calcium acetate decreased, owing to the manufacture of alcohol and the closing down of the Acetate Section for four months for the purpose of replacing the unsatisfactory Queensland pine tanks with vats made from New Zealand kauri timber. During this year 2½ tons of sodium acetate was also produced. In 1920-21 the production of acetate was nearly doubled, and proved that the Factory plant was equal to the capacity for which it was designed. In November, 1920, the output of acetate was reduced and the alcohol production increased, with the result that the output was 72,394 gallons of alcohol for the year. Permission was also granted for the methylation of spirit at the Factory, and 60,711 gallons of spirit were methylated during the year. At the time there was a good market for alcohol, and the production of cordite also called for regularity in the supply of acetate of lime so that it was decided to increase the molasses bulk storage at both ports: to 1,400 tons at Cairns and 440 tons at Brisbane, ~~but~~ later in 1921, as recorded in a preceding paragraph, questionings by Mr. A.E. Leighton as to the current requirement for Cordite resulted in a decision in December of that year that the production of the Cordite and Acetate of Lime Factories was to be so regulated as to provide that the security reserve stock of Acetate of Lime would never exceed 850 tons in all, whether it was held at Bulimba, Queensland, or at Maribyrnong, Victoria. This meant that the production of Acetate of Lime would be spasmodic and could cease for a time and that the Bulimba Factory "could be utilised for alcohol production alone and this could be extended to provide for keeping together a nucleus staff and to meet our minimum liabilities in respect to molasses and freight contracts." That

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Footnote

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section of the factory was strengthened consequently by installation of a duplicate still, comprising two analyzers and a rectifier and the production for the year was increased to 104,143 gallons alcohol, of which 84,326 gallons were methylated. These efforts nevertheless were insufficient for maintenance of the factory as a going concern, and very soon the utilisation of what actually was a very fine chemical plant became a problem. As it was entirely an accessory of the Government Cordite Factory in Victoria, and was only located in Queensland for economic reasons - the freightage of the raw molasses from North Queensland to Victoria about 2,250 miles, being prohibitive - it will be evident that whatever the circumstances appertaining to the Cordite Factory, rise or fall, they would be more pronounced in the case of the Acetate of Lime Factory. A few months later, in consequence of the institution of the 1922 Programme, when the existing Government factories were reduced to working upon a "nucleus basis", the special circumstances of the Acetate of Lime Factory were examined by the Assistant Secretary of the Department of Defence, Mr. M.M. Maguire, in his capacity as a member of the Munitions Supply Board, and his report was presented at a meeting of the Board on 23rd March 1922, extracts being as follows -

The plant has an annual outturn capacity of:-

500 tons of Acetate of Lime (equivalent to 32,750 gallons of Acetone or 500 tons of Cordite)

and

120,000 gallons of Alcohol;

or

250,000 gallons of Alcohol if the factory be worked only on Alcohol.

footnote

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1922/403

The time has arrived when the manufacture of Acetate of Lime must be suspended, as the reserve stock held at the Cordite Factory is adequate to meet all prospective defence requirements for a few years ahead.

The manufacture of Alcohol in the form of methylated spirit has been carried on since August 1920. During the half-year ended 31-12-21, 56,979 gallons were produced at an average cost of 2/4 per gal. The selling price averaged 2/4½ per gal. Methylated spirit has been a useful side line, and has given relief to acetate manufacture on general charges. The continuance of its manufacture to the full capacity would in a great measure simplify the problem of how the Factory is to be maintained with a nucleus staff as an essential adjunct to an Australian Munitions Supply Scheme which aims at self-containment. Various protests have been recently received, however, from the Colonial Sugar Refining Company and certain Australian distilleries against the policy of competition by a Government Factory. These private interests contend that they are in a position to produce more spirit than the Australian market can absorb, and that if the Government Factory does not withdraw its competition the effect will be to close down some of the Australian distilleries. On the other hand, users of methylated spirit have written to the Department of Trade and Customs, and to this Department expressing alarm at the possibility of the Defence Department ceasing to manufacture and leaving the control of supplies in the hands of one or two firms who it is feared will regulate to suit themselves the quantity of spirit to be made available to consumers.

Accepting the position that the manufacture of Acetate of Lime must be discontinued for some considerable time, the question remains for decision as to the best means to adopt from all points of view to preserve the Factory as an effective unit of Munitions Supply to be available as and when required. Three alternatives are presented, viz:-

- (a) To lease the Factory for a term of years to a firm that would continue alcohol manufacture;
- (b) To maintain the Factory on a nucleus basis only with such staff as may be necessary to preserve the plant in a condition in which it could be readily brought to full production should occasion arise;
- (c) The Department to carry on the manufacture of industrial alcohol to the full capacity of the Factory.

It was generally agreed that (c) was the course most to be favoured but that to pursue it in competition with commercial industry was fraught obviously with difficulty until Mr. N.K.S. Bradbitt (Chief Chemical Engineer) suggested that the Alcohol

could be manufactured and converted into Motor Spirit by the addition of 25 per cent Benzol, and that the Factory output could be readily absorbed by the Commonwealth Departments operating fleets of motor vehicles, the Postmaster-General's Department in particular. Mr. Brodribb also suggested that as the issues involved concerned the Department of Customs and Excise, together with such factors as efficiency and price, an inter-Departmental Committee should examine the proposal. In April 1922, the Minister for Defence, as a result of Cabinet consideration of the matter, having regard to the importance of the Factory as a unit of munitions supply, asked the Minister for Customs and the Postmaster-General to agree to the appointment of a Committee, representative of the three Departments, which would consider a proposal for the Factory to manufacture alcohol fuel for the use of motor vehicles of Commonwealth Departments. Messrs. Percy Wilkinson, Federal Analyst; A. Little, Commonwealth Controller of Stores; and M.M. Maguire, Assistant Secretary of the Department of Defence, were appointed to represent the Departments concerned, and instructed to report to the Minister for Defence. It was arranged in the meantime that a nucleus staff should be maintained at the Factory, and it would continue to produce a limited quantity of alcohol, which would be disposed of wherever possible. With the permission of the Postmaster-General, the Committee arranged for exhaustive fuel trials with motor cars and trucks belonging to that Department. These tests were carried out under the direction of Mr. Percy Wilkinson, and proved that the motor vehicles of Commonwealth Departments can be satisfactorily operated with alcohol fuel. It was ascertained that the annual output capacity of the Acetate of

endum

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Lime Factory would be 250,000 gallons of alcohol, which should be sufficient to meet the annual requirements of motor spirit of Commonwealth Departments, of which the Postmaster-General's Department ~~was~~^{was} the largest user.

The Committee thereupon presented a report on 28th December, 1923, and recommended:-

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- (a) The Department of Defence be asked to make arrangements for the manufacture of alcohol fuel at the Acetate of Lime Factory for the use of Commonwealth Departments.
 - (b) The price to be charged by the Defence Department to be equivalent to the current prices of petrol, taking into consideration the mileage efficiency of alcohol fuel as compared with petrol. This will no doubt mean some loss to the Defence Department, but it is understood that the Defence Department is willing to bear such loss in consideration of the advantage that will be gained by having the Acetate of Lime Factory maintained in working condition as an effective unit of Munitions Supply.

The fuel proposed by the Committee was to comprise alcohol and ether to be made at the Acetate of Lime Factory, and benzol to be procured from the by-product of the coke ovens at Newcastle. This meant that an ether plant would have to be installed at the Brisbane Factory at cost of £750, but already that had become a Defence requirement and would have been undertaken in any circumstances.

The Munitions Supply Board concurred with the proposals, especially as they appeared to be the only practical solution of the problem of preserving the Factory as an effective unit of Munitions supply to be available as and when required. It was proposed that the alcohol fuel would be supplied to Commonwealth Departments by the Defence Department at the equivalent price of petrol, taking into consideration the relative mileage efficiency of the two fuels and that the difference between expenses of operation of the Factory and

proceeds from sales of alcohol fuel should be regarded as the cost of maintaining the Factory as a Defence unit. The Minister (the Hon. E.K. Bowden), in recommending the proposals to the Government, explained that they were not put forward with the idea of producing motor fuel at a less cost than imported petrol can be procured, because it was recognized that the whole cost of operating the Factory cannot be met by the sale to Government Departments of alcohol fuel at the equivalent price of petrol, but there was no other way in which the Factory could be maintained as an effective munitions unit. There had to be considered also the important bearing the use of alcohol as a motor fuel would have upon military transport in a time of emergency, when supplies of petrol from overseas might become unobtainable, and it was felt that the experience gained by use of the fuel in the Commonwealth vehicles should be invaluable in such emergency. The Government approved on 31st January 1924, and it was arranged with the Postmaster-General's Department that supply would commence in August 1924.

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For 1924-1925 the production of power Alcohol was 75,985 gallons, and for 1925-1926 it was 99,600, the greater portion of which was taken by the Postmaster-General's Department. The remainder was used in the motor vehicles of the Royal Australian Air Force and the Munitions Supply Board. The records of the time show that one gallon of power alcohol contained -

Crude alcohol	.666	gallons
Benzol	.225	"
Wood Naptha	.006	"
Pyridene	.002	"
Ether	.101	"

all of which were prepared from Australian sources, and that a percentage distribution of the total cost of a gallon would be

Labour	6.9	per cent
Materials	61.2	" "
Freight and distribution	15.3	" "
Coal and general expense	16.6	" "
	<u>100.0</u>	

During the early months of the year 1925-1926, questions began to arise in the office of the Munitions Supply Board as to whether the results being obtained at the Factory were commensurate with the costs of continuing it as a going concern; whether it would be more economical to close the Factory altogether, with no more expenditure than would be required to meet the expense of a caretaker staff. The outgoings were considerably more than had been anticipated, what with increases in the cost of the raw materials and the difficulties continually arising with the shipowners as to minimum charges for freight of molasses, port delays and the demurrages, etc. and the molasses storage tanks at Cairns were constantly needing repairs. Coupled with these hindrances, the current selling price for petrol had dropped, ~~and~~ As the selling price for power alcohol was based upon that, with due allowance for its comparative inefficiency, it worked out that if the Factory was to be continued as an operative unit, it could only be by drawing upon the restricted "Nucleus Vote". Meanwhile the demand for power alcohol had been increasing. The original estimate of sales was stated at 100,000 gallons annually, but lately it had been at the rate of 130,000 gallons per annum made up thus -

P.M.G. Department, Melbourne	78,000	gallons
" " Brisbane	22,000	"
Air Board, Melbourne	20,000	"
Munitions Supply Board, Melbourne	10,000	"

and an increased demand from the P.M.G. Department had been notified. In order that the Munitions Supply Board might be

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fully informed, the Chairman and I visited Brisbane and examined all the details of financing the Factory, and we reached the conclusion that we could not go on subsidising the production and sale of power alcohol at the rate of 130,000 gallons annually; that that figure should be reduced, and certainly that no increase of orders could be contemplated. The matter was discussed with the Munitions Supply Board on 29th September 1925, and it was agreed that proposals should be drafted for operations to be continued but upon a reduced scale that would afford relief to the demands upon the Parliamentary Votes. A plan was prepared accordingly which did provide for some reduction of employees, and a substantial reduction in the freight charges both inwards in respect of molasses brought from Cairns and outwards as regards power alcohol sent to Melbourne for the P.M.G. Department, ~~but~~ Unfortunately it could not be wholly decisive because while the contracts with shipowners admitted of one ship being laid off in the near future, the Factory was tied to employ the second one as a molasses carrier for another four years. The revised scheme was approved by the Board on 22nd January 1926 for submission to the Minister (Hon. Sir Neville Howse), and approved by him as a stop-gap measure, but in the course of his discussion with the Chairman of the Board (Mr. A.E. Leighton), Sir Neville Howse expressed a desire for a more extensive review of the part the Factory was playing in Defence policy. It was apparent that he favoured closing down the Factory altogether and applying some of the savings thereby to laying-in reserve stocks of Acetate of Lime by means of purchases from abroad. This review was duly prepared and considered by the Munitions Supply Board on 11th February 1926. The purposes of the Factory and the sequence of events were

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recorded, together with the hindrances which had to overcome, the contracts still binding upon it and others which might have to be renewed, and its importance from the viewpoint of self-containment. It was mentioned that in comparison with 1922, while there was no change in the necessity ~~for~~ the Factory from the self-containment standpoint, the only binding contract remaining after 30th June would be for freightage on one ship with a liability to the amount of £1,200 per annum for four years. Further it was stated that the annual cost of the Factory operated on the reduced basis tentatively approved would be about £12,000. ~~But~~ if a change were made to a "care and maintenance" arrangement, with the Factory in complete idleness, the cost would be about £6,300 per annum, but the Board was unable to recommend that for consideration. The Board submitted the following alternatives for consideration -

1. Operate the Factory to the extent of 1,000 tons of Molasses per annum at estimated cost of £12,000 per annum, which would keep together the staff, retain skill in process, and maintain the Factory in good working order. The production would be about 70,000 gallons power alcohol, of which the P.M.G. Department in Brisbane would take about 20,000 gallons and a market would have to be found in Queensland for the remainder.
2. Close down the Factory altogether and leave it in the hands of caretakers. Face up to the fact that the works are going into decay, and that, when they are wanted, considerable time and money would be spent in regeneration. Provide for this lag by adding to the reserves of Acetate of Lime by purchase from abroad.
3. Offer a lease of the property to the Queensland Government as a going concern for production of alcohol, on condition that the works were kept in order in the event of their being required at some time for Defence purposes. (This suggestion was made because of an interest being developed in Queensland in regard to the possibilities of alcohol as a motor fuel - no doubt this followed upon the successful production of a limited quantity at the Acetate of Lime factory).

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It was not surprising that the Ministerial decision favoured alternative (2), and it was acceptable also to the Munitions Supply Board, but the Board did not care to have the responsibility of recommending dispersal of a production unit held to be a necessity in time of war. On 16th June 1926 the Board discussed the steps to be taken -

1. Factory to be closed down on 30th June 1926.
2. Discharge of Factory personnel was in hand and services of all but the permanent staff (the Manager, a chemist and a clerk) and four wages employees would be terminated by 30th June. Of the permanent staff, the Manager would retire soon and the chemist and clerk transferred to other positions in the Public Service.
3. Negotiations to be opened for termination of the ship contracts, under which there was an obligation of about £5,000.
4. Action to be taken for disposal of the Cairns Molasses Storage depot.
5. Stores no longer required at Factory to be disposed of to best advantage.
6. Cost of Maintenance annually including the four employees estimated to be £1,380.

These proposals were duly approved by the Minister for Defence.

Subsequently the Defence Contract Board was charged with disposal of the stores and movable plant adjudged to be no longer required.

Apart from items considered necessary to be retained at the

Factory for repairs and maintenance purposes, the Contract office

was instructed that in the disposal of goods no longer required

the Branches of the Munitions Supply Board would have first

claim, and then they could be transferred to the Service Boards

as free issues, except that credit for the free issues could

be taken at book value in the accounts of the Acetate of Lime

Factory. Any goods remaining after Branches of the Department

had exercised a choice were to be sold to the public by the

Contract Board and credit taken in the Accounts of the Acetate

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of Lime Factory. With regard to the Cairns property, as the Commonwealth had never acquired a title to the land upon which the depot had been placed, and consequently there was uncertainty as to the exact position in the event of sale as a going concern, it was decided that the Department of Works and Railways, as the authority administering the Commonwealth Lands Acquisition Act should take charge of the disposal either as a going concern, or by purchase and removal of all the plant and equipment. It can be mentioned here, too, that a satisfactory arrangement was made with the Shipowner firm, John Burke Limited, that the contract would be terminated on payment of a lump sum of £2,000, and for its part the firm would retain the Molasses tank in one of its ships - and so be available at short notice if required until the end of 1929. This meant a saving of £2,141 for the Commonwealth under its contract obligations. In December of 1926, the Colonial Sugar Refining Company offered to purchase the Cairns Molasses Storage Depot for £1,500 subject to the Cairns Harbour Board granting a lease of the land and a reduction of the Harbour Dues. The offer was duly accepted. It was far below the book value, £16,017⁷ but there were no other likely purchasers, and it was only acquired to supplement the Company's own storages in the event of its shipping Molasses from Cairns. On 31st December 1927 the Factory was placed in Reserve under the supervision of the Secretary of the Department's local Contract Board, with a caretaker living on the factory area and three employees for care and maintenance.

During the whole of 1928, apart from occasional reports from the caretaker as to conditions locally, the Factory remained in reserve but interest was revived in December of the

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year by an enquiry by a business man as to a lease for purposes somewhat similar to its previous use. The proposal was considered by the Munitions Supply Board as feasible but it decided to advise the Minister that public tenders should be invited on terms that would preserve the factory so that it could be resumed for Defence purposes should occasion arise. However no tenders were received although some half-dozen tender forms had been issued to enquirers. These people were interviewed subsequently but all of them had some reason or other for not tendering, the main objection being apparently that the plant was too large. After that matters just drifted along in charge of the caretaker until March 1934 when Mr. Leighton submitted to the Munitions Supply Board "A proposal to abandon the Acetate of Lime Factory, Brisbane." He said that while he was in England he consulted the Supply Board of the Committee of Imperial Defence, on 11th July 1933, and its conclusion was -

that the maintenance of the acetone factory in Brisbane, Australia, is not considered necessary from the point of view of Imperial requirements beyond Australia.

Mr. Leighton pointed out that manufacture of Acetate of Lime ceased in June 1922 and production of Alcohol and Power Alcohol ceased in 1926, and that the Factory was then closed down. He outlined the circumstances of the establishment of the factory and the decline of the importance of acetone in the manufacture of Cordite, it was no longer employed in the production of Naval Cordite, and probably would not be required in future in any type of Military Cordite other than .303" ammunition; and that through the manufacture of Aeroplane Dopes the technique of manufacture of nitro-cellulose had been acquired and thus the production of a propellant explosive not requiring acetone could be developed if necessary. Already an explosive of the type

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was being manufactured in the shape of the Naval S.C. Cordite. With regard to the acetone still being used in the manufacture of .303" ammunition, he said that it would be cheaper to lay in reserve stocks of imported acetate of lime than incur capital expenditure in re-establishing the Brisbane factory, and that anyhow there was sufficient acetate of lime already in stock for 223,000,000 rounds of ammunition. He also said that the cost of maintaining the factory in reserve was £1,000 per annum and that this would be saved by disposing of the factory. The Munitions Supply Board expressed the opinion that the factory could be abandoned and suggested the matter should be referred by consideration by the Defence Committee. The Defence Committee concurred with the recommendation of the Munitions Supply Board and on 6th July 1934 the latter agreed that a large proportion of the plant and fittings could be utilised with considerable economy in connection with the new works in progress in the Maribyrnong and Footscray group of factories and that some thousands of pounds of capital expenditure would thus be obviated at cost of transfer of only 50/0d per ton; that, after all plant and fittings useful to the Department had been removed, the remainder should be sold on the site by auction; and that the land and buildings should be transferred to the Department of the Interior for disposal as it thought fit in its capacity as the agency for control of real estate owned by the Commonwealth. This transfer was given effect in February 1936, the book value being £39,523, and the Munitions Supply Board thereafter ceased to be interested in the property. The proceeds of sale of plant and fittings, coupled with assessed values of items taken over by other sections of the Department, amounted to £6,689, and £45,742 had

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