

GLAXO

A History to 1962

*R. P. T. Davenport-Hines
and Judy Slinn*

Glaxo is the world's second largest pharmaceutical corporation. This study of the company, from its beginnings to 1962, is based on unprecedented and unparalleled archival access to the company records. It gives a detailed account of the global operations of Glaxo, and describes not only the evolution of this international business, but studies its research and development programmes, its products, and its marketing and management. It is the first comprehensive study of a UK-based drugs company and one of the relatively few scholarly studies yet written of front-ranking world companies.

Glaxo: A History to 1962



Portrait of Alec Nathan by Sir James Gunn. RA

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R. P. T. DAVENPORT-HINES and
JUDY SLINN



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Introduction

In 1991 the Glaxo Group's turnover in its business, now wholly devoted to the discovery, development, manufacture and sales of prescription medicines, was £3,397m and profits (before tax) were £1,283m. Over the last two decades remarkable and mainly self-generated growth has made Glaxo the largest pharmaceutical company in Britain and taken the company to second place in the world league of the industry. Glaxo's operations and sales extend across the world with more than 80 per cent (87 per cent in fact, when the UK is included) of turnover arising in the developed countries of Western Europe and North America.

The group's competitors, the multinational pharmaceutical corporations, have varied origins but those of Glaxo must be among the most unusual. The entry into the dried milk business of the Nathans, a small Jewish family firm of merchants in New Zealand, came about by serendipity rather than deliberate intent. It was the determination of one member of that family, Alec Nathan, which kept and developed Glaxo babyfood as part of the Nathan business. In the two decades after 1918, the discoveries made by nutritional researchers took the Nathans into vitamin manufacture in order to strengthen the Glaxo range of products.

At the same time the company developed its international operations and Glaxo products were sold, and some manufactured, not only in the company's traditional spheres of interest, Australia and New Zealand, but also in India, Africa, Europe and North and South America. As the importance and profitability of the Nathans' traditional merchanting activities declined, the attractions of the new pharmaceutical industry were consistently urged on the company by Harry Jephcott; but the tendency to diversify rather into the food and associated industries remained strong in the business.

The Second World War, however, proved to be the turning point for the company. In the short-term there was an acute and urgent need to manufacture in Britain pharmaceutical products which had previously been

imported from Germany. In the long-term, and more significantly, Glaxo became involved with the development of penicillin and by the end of the war, the company was a pharmaceuticals manufacturer.

The post-war years were a period of rapid growth for the pharmaceutical industry internationally as new synthetic drug remedies for many previously untreatable diseases were found and launched on the market. Glaxo Laboratories, the name the Nathan company as a whole now took, participated in this growth and, as the period covered by this history drew to a close, a new generation of pharmaceutical products, the result of work done by the company's research and development scientists, were launched. Yet by comparison with the size of operations of Glaxo's main competitors in the 1950s, the US pharmaceutical corporations, Glaxo Laboratories, like most other British companies at the time, was small. It was, therefore, to strengthen and defend the British pharmaceutical industry as well as itself, that Glaxo merged with Allen & Hanburys and Evans Medical.

This history ends in the early 1960s, when Glaxo Laboratories, under the leadership of Harry Jephcott, was established as a leading British company with a strong, but not yet exclusive, attachment to the pharmaceutical industry. Its activities and interests overseas were, in the fashion typical of British business then, orientated principally towards the countries of the Commonwealth.

The subsequent transformation of Glaxo into a highly specialised transnational pharmaceutical company is another and different story.

Merchants and bonnie babies

The origins – Joseph Nathan & Co

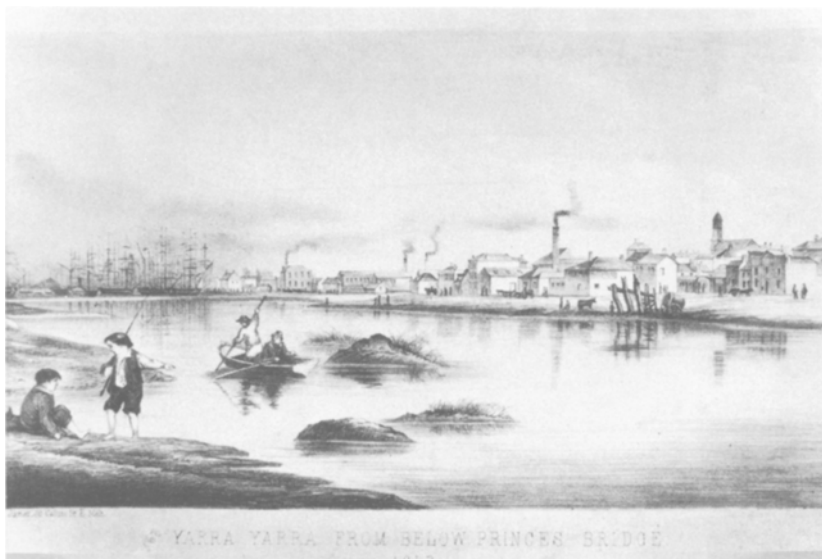
From London to Melbourne

Joseph Edward Nathan, founder of the company from which Glaxo Laboratories grew, was born in London on 2 March 1835. He was the sixth son of a wholesale tailor, Edward Nathan, and his wife Rachel. Family tradition held that Nathan père was, or became, ‘a charming old man with very little brains’, while the mother ‘was a highly intelligent woman with not a great deal of education’.¹ The Nathan family lived in Houndsditch, an area of east London just outside the boundaries of the City and for many centuries a centre of the clothing trade. By the early nineteenth century Houndsditch had a large Jewish population – they built a synagogue there in 1809 – and there were many small factories, warehouses and businesses in the area.² From the age of about twelve, Joseph Nathan helped his father in his small business of making suits and clothes which he then sold in and around London. Even at that early age Joseph showed signs of business acumen and entrepreneurial zeal; from the travellers who sold cloth to his father, he learned of the possibilities of an export trade and urged his father to launch into this line. He succeeded in persuading the old man to buy a tail-coat and silk hat to make himself more presentable, and sent him to drum up connections for export business; but Edward Nathan had no heart for expansion and nothing came of the venture. Disappointed at this, young Joseph left his father’s business and went to work for a Houndsditch furniture store. At the same time he sought to improve his education in his spare time.

In 1852 Rachel Nathan died. For Joseph, on whom she had been a strong influence, her death was a shock which, combined with other factors, forced a turning point in his life. In England he could see little prospect of realising his ambitions and his health was poor, for he had always suffered from asthma which was exacerbated by the filthy air of east London. Late in 1851 gold had been discovered in Australia, at Ballarat near Melbourne and, as

the news of the discovery reached Europe, many left to undertake the long journey to join the rush to riches. Joseph Nathan decided to seek his fortune and repair his health in Australia. With a few friends, including one who became a lifetime associate, Henry Isaacs, he embarked on the *William Ackers*, a 330-ton barque which left London in August 1853, bound for Melbourne and Sydney. As well as the passengers, the ship carried a mixed cargo of goods needed in Melbourne, including soap, currants and raisins, sugar, cheese, spices, brandy and gin.³ It landed on 27 December 1853, at Melbourne, then in the process of dramatic growth. A small mainly pastoral settlement until the discovery of gold, Melbourne's population tripled between 1851 and 1854 with the influx of immigrants. Like many another, Joseph Nathan set off for the goldfields. However, according to family sources, on his way he met a policeman (or goldfields' warden) who warned him that the chances of making a fortune in gold prospecting were slim, but that a better 'goldmine' lay in starting a store supplying blankets, foodstuffs, picks, shovels and other such necessities required by the diggers. Young Nathan took this advice, returned to Melbourne and set up in business. Although nearly penniless on his arrival he was fortunate in his family and Jewish connections. The Moses brothers, owners of the Monkwell Street Warehouse Company, were kinsmen who dealt with his father's tailoring business and they had a policy of giving financial backing to Jewish boys of good character. They supported young Nathan in starting his business.

No record has survived of Joseph Nathan's early years of trading in Melbourne. By 1857, however, he was established in Collins Street, one of the main retailing streets of the city. There, too, lived the Marks family, who had also emigrated from England (from Stoke Newington in London), some months before Joseph Nathan, arriving in Melbourne in March 1853. Marks was a merchant and it was his daughter, Dinah, that Joseph Nathan decided that he wished to marry. Her mother, Jane, had been a Nathan before she married and possibly, therefore, the young couple were distantly related.⁴ Meanwhile, back in London, Joseph Nathan's eldest sister, Kate had married in 1855. Her husband was Jacob Joseph, a merchant who, despite the handicap of blindness, had established his business in Wellington, New Zealand, during the previous decade. Soon after the couple returned to Wellington, Jacob Joseph, wishing to return to London again, asked his brother-in-law to come from Melbourne to Wellington to look after his business in his absence. Joseph Nathan seized the chance to negotiate a partnership and, when the bargain was struck, Joseph, then 22, and Dinah, aged 19, were married at her father's house in November 1857. The young couple left soon afterwards to sail to New Zealand.



1 Melbourne, the Yarra Yarra in 1853 as Joseph Nathan knew it.

Early days in New Zealand

The Nathans reached Wellington in December 1857. With a population then of less than 4,000, Wellington was much smaller than Melbourne and still more of a pioneer settlement. It was not, however, without some amenities; two theatres, a number of hotels, two newspapers and three fire-engines, the latter necessary because all the buildings were made of timber. Although the European population of New Zealand doubled between 1847 and 1860,⁵ a transport infrastructure was largely undeveloped until the colony became more settled after the end of the Maori wars in 1869. The general merchant's business in which Joseph had arranged to participate depended largely on the arrival of a motley range of goods from England. The partners ordered from London anything for which they thought they might find a market and then apportioned the imports among their customers.

The partnership of Joseph and Nathan lasted until 1873. Never peaceful, for Jacob's blindness made him very suspicious, there were constant quarrels over sharing the profits and, in 1873, a final rupture led Joseph Nathan to sever the partnership and begin as a merchant trader on his own account. By that time he had a large family to support. Between 1858 and 1877 Dinah Nathan bore fourteen children, eleven of whom survived. Three of Joseph Nathan's brothers (David, Hyam and Lewis) emigrated to New Zealand, too, and established themselves, with varying success, as traders.



2 Cameo portraits of Joseph and Dinah Nathan taken about 1860.

There does not seem, however, to have been any involvement in business between them and when Joseph Nathan decided, in 1876, to visit London to see his father, then in ailing health, he left his young business in the hands of two strangers. Messrs Watty and Roxburgh, despite a recommendation to Nathan from a local bank, turned out to be an alcoholic and a rogue respectively. Together they brought the business to the verge of bankruptcy. On Joseph Nathan's return to New Zealand he had to make a renewed effort to rebuild his business. In London his old friend, Henry Isaacs, acted as his agent in offices in Sugar Loaf Court, off Leadenhall Street, while in New Zealand, as his sons came of age, they joined him in developing the business. The first to do so was the eldest, David, who was 22 at the start of the 1880s – a decade which saw considerable changes and an expansion of the family business.

Steamships were already changing the pattern of travel between Britain and her colonies, but more slowly, because of the distance, as far as New Zealand was concerned.⁶ The introduction of steamships with refrigerated holds made possible the transportation of meat and dairy products from Australia and New Zealand to the increasing urban populations of Great Britain. The first successful cargo of frozen beef and mutton travelled from Melbourne to London in 1880 aboard the *SS Strathleven*. Two years later the first cargo of meat went from New Zealand. Joseph Nathan helped to pioneer New Zealand frozen meat and was an early chairman of the Wellington Meat Export Company, formed in 1881 as a farmers' freezing cooperative.⁷ His commercial acumen made him realise that the improvement of transport was vital to the development of mercantile businesses like his own. With Henry Isaacs he helped to organise a New Zealand freight

On Sale	
J OSEPH NATHAN & CO, LAMBTON QUAY, HAVE ON SALE	
GENERAL IRONMONGERY , comprising —Copper rivets and burs, tower bolts, drawer knobs, punches, braces, com- passes, ship scrapers, wire gauges, caulking irons, cutting plyers, dust and furnace shovels, coopers' vices, foot rules, beer and spirit cocks, cheese tasters, lanterns, tinman's snips, Scotch shears, gimlets, &c, &c 100 kegs Ewbank's nails 100 ditto wire nails 30 dozen galvanised buckets 20 ditto Parke's CS spades 20 ditto Foster's ditto ditto 10 ditto potato forks 4 casks Sorby's tools 2 cases Nixey's black lead	
BRASS GOODS —Sash fasteners, rack pul- lies, hat and coat hooks, hat hooks, sash screws, sash lifts, cot swings, table catches, roller ends, gun hooks, cup hooks, jack chains, sash rollers, &c, &c	
OILS AND PAINTS —Boiled and raw oil, turpentine, white and red lead, sheet lead, &c, &c 20 casks zinc	
MARBLE MANTLEPIECES —A large variety, in white, black, and other marbles	
PAPERHANGINGS — 30 bales of the newest French and Eng- lish designs 20 cases Chance's sheet glass 100 boxes Belgium ditto	
BRUSHWARE —Paint, oil, hair, scrubbing, clothes, shoe, bannister, stove, whiting, plate, hearth, and horse brushes, broom heads, &c	
CROCKERY —100 crates, assorted—Toilet sets, ewers, jugs, chambers, white and gold and blue and white cups and saucers, basins, mugs, &c, &c	
OILMEN'S STORES — 20 cases sulphuric acid 180 ditto Bell and Black's vestas, plaid, 250s, 500s, and 1000s 30 casks Day and Martin's blacking, paste, 6d, and 1s	
10 cases soap powder 5 casks carraway seeds 500 boxes Price's candles 20 cases Brown and Polson's corn flour 50 ditto Morton's pickles, mixed, Im- perial hot, and West India 40 ditto salad oil, pints and half-pints 30 ditto herrings, kippered and red 6 casks ginger, bleached, unbleached, and ground 3 cases essences 2 ditto mixed spice 20 ditto castor oil, half-pints and qr-pints 20 ditto hair oil, ditto ditto 5 ditto tartaric acid 80 ditto sardines, half and quarter 1 case cream of tartar 20 kegs saltpetre 40 cases Colman's Mustard, D.S.F. and Durham 55 ditto Colman's starch, blue, white, and glaze 40 ditto Colman's blue, indigo and Wind- sor 20 ditto capers, C.&B. and Batty's 30 cases currie, C.&B., Batty's, and W y brow's 10 casks Barcelona nuts 20 cases patent barley and groats 10 chests sago 2 cases West India arrowroot 3 ditto nutmegs and cloves 15 ditto cocoa, Epps', Taylor's, and Fry's 10 ditto chocolate, Barry's 3 ditto candied peel 10 ditto salt, in jars 10 ditto bath bricks 20 casks whiting	
WINES AND SPIRITS — Rum—Lemon Hart's, 14 o.p. Rum do do 34 o.p. Rum—Twiss and Browning's, 10 o.p. Brandy, dark—Martell's, quarter casks do pale do do Port—quarter casks and cases Sherry do do Whisky do do Brandy—Hennessy's Old Tom—cases Champagne and Moselle Claret—St Julien do St Estephe Ginger Wine Stout Ale	

3 The first advertisement by Joseph Nathan & Co, in the *Wellington Independent*, 26th June 1873.

shipping company, which chartered sailing ships from reputable London owners and ran cooperative freights all over New Zealand. In Wellington itself, Nathan proposed the formation of the Wellington Harbour Board. He was a member of the Board for some years and was instrumental in bringing in a high-grade engineer who re-modelled the whole harbour and designed the docks. He was also a director of the Wellington Patent Slip Company, which repaired small ships and coastal boats.

Nathan was not only involved in shipping. Railways opened up New Zealand for trading and settlement and between 1882 and 1886 Nathan was one of the chief promoters of the Wellington and Manawatu Railway Company. The policies of Sir Julius Vogel as Colonial Treasurer from 1869, and as Prime Minister from 1873 to 1875, involved heavy government borrowing, which had produced wild land speculation, in which Joseph Nathan participated. After the conclusion of the Maori wars, Vogel's government, which could not afford to pay off the British soldiers and sailors with cash, instead gave them 'Land Certificates' which were in effect allotments of pieces of land in Manawatu. Joseph Nathan used to buy these certificates at £25 each from the discharged soldiers, taking his chance whether the land allotted would prove to be swamp or mountain top in the hope that the value would be raised by railway connections, a hope eventually realised.

Sir Julius Vogel returned to England and was the New Zealand government's Agent in London until 1881 when he was forced to resign because the colonial government objected to his company-promotion activities; his help, however, was enlisted by Joseph Nathan, and Vogel arranged for the flotation of debentures worth £560,000 to finance the construction of the Manawatu railway. A London board was formed including Sir Penrose Julyan (Director of the London and Westminster Bank, and formerly Crown Agent) and Sir Edward Stafford (Prime Minister of New Zealand 1856–1861, 1865–1869 and 1872). Also a director was A. J. Mundella, the British radical politician who was later forced to resign as President of the Board of Trade in 1894 following the collapse of the New Zealand Loan Co, of which he had been a director. The completion of the Manawatu railway was celebrated with the ceremony of hammering in the last spike in November 1896, with the Governor doing the hammering; Joseph Nathan, as Chairman of the Board, gave a long address in which he spoke of the hopes and intentions that the railway would open up vast areas of New Zealand for development.⁸

The financial and other strains imposed on Joseph Nathan by the financing and building of the Manawatu railway during New Zealand's recession of the 1880s, depleted his strength, and his sons considered that he never fully recovered.⁹ Indeed, although he was several times approached to

stand for the New Zealand Parliament, he always declined, saying that his experience in lobbying for the railway had determined him 'never [to] be connected with such a set of Parliamentary blackguards again'.¹⁰ Nevertheless, for the Nathan business the railway provided the immediate advantage of easier access to the store in Palmerston North, opened in the 1880s, as the 'Ready Money Stores', which was, from 1885, managed by Maurice Cohen, one of Joseph's sons-in-law.

By the early 1890s, the introduction of a regular fortnightly steamer service from Britain brought changes to merchanting activity. The Nathans found themselves facing increased competition in country districts: they began to be supplanted as wholesale import distributors by manufacturers' representatives selling direct to retailers. To widen his business, Joseph Nathan tried to diversify into the wool business, but found that the stock and station agents were too large and well established to challenge. Instead of wool and, at the prompting of his son David, he next turned to one of New Zealand's other great agricultural products, butter. The New Zealand government had already recognised the possibilities created by refrigerated ships, recruiting Danish experts on dairy product trade to advise on the development of these export lines. Around the same time, the perfection of the technique of Babcock's milk test enabled farmers to establish the butter-fat content of milk supplied to creameries so that they could be paid precisely in accordance with the butter-fat they delivered. This proved a further stimulus to New Zealand dairying. The refrigeration boom and Babcock's discovery resulted in the formation of farmers' cooperative associations to market and export butter.¹¹

In the course of their commercial travelling tours through New Zealand, the Nathan family had built a good understanding with the many farmers' cooperatives which characterised the country's agriculture and, in 1891, David and Louis Nathan had discussions with the Cooperative Society at Palmerston North on the northern island of New Zealand. Two seasons earlier, the Society had lost its entire capital of £2,000 through buying butter, a loss it had recouped in subsequent years by doing business in groceries, locks and ironmongery. David, apparently without consulting his father, suggested that his family firm should take over the Society's butter marketing in London in return for a share allotment in the profits of the Society of about £500. David urged this scheme successfully on his father: 'It is the nucleus of a good business, and they sadly want more capital and a London office as now they must sell locally all produce.' Joseph Nathan & Company seized this opportunity and became the financial supporters, and distributors on commission, of the first dairy farmers' cooperative in Wellington province. After a few years the Nathans were succeeded as the Cooperative's agents by another firm and so they bought their own butter

(a)



(b)



(c)



(d)



(e)



(f)



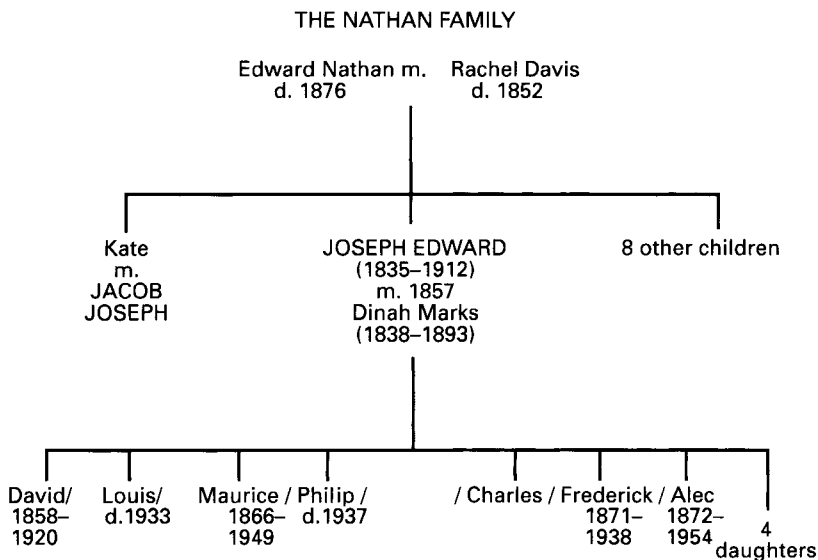
4 Joseph Nathan's sons (a) David (b) Louis (c) Maurice (d) Phil (e) Fred (f) Alec.

factory at Makino. Within a short time the Nathans had seventeen little creameries in dairy districts.¹² Louis Nathan, Joseph's second son, was sent to Australia to study the creamery system supplying butter factories, which had been pioneered in Victoria, and by the end of the nineteenth century it was a solid element in the profits of the firm of Joseph Nathan & Company. These profits came not only from butter exports but also from specialised lines for which the firm was increasingly renowned throughout the colony, such as special brands of Union Teas.

Joseph Nathan's later years

By 1893 Joseph Nathan had spent nearly forty years in business in New Zealand, counting the time he spent in partnership with Jacob Joseph and his own years of independent trading. In his speech at the inauguration of the Wellington-Manawatu railway in 1886, he had referred to the 'feeling of self-reliance and thorough earnestness which, when directed towards a good purpose, invariably leads to success', and expressed his belief in 'well-directed energy and perseverance', and 'united action for the common good'. It was an outlook prevalent among New Zealand's prosperous merchants of the period, so that, for example, an Auckland newspaper in 1882 praised the business opportunities in a colony 'where the social disabilities, the exclusive taste, the over-strained competition and stereotyped conventionalism of the Old World have not yet taken root – there is a clear field for men of talent, skill and energy to climb the social ladder, and to attain to a degree of wealth and social elevation that is possible only to the favoured few in older countries'.¹³ This open and egalitarian spirit remained the hallmark of the Nathan (and later the Glaxo) way of business long after it had become mere cant in New Zealand society. For Joseph Nathan such a *credo* was not only to be applied in his own business, but also in service to the community, both to his own Jewish fellows and to society in a wider sense. For the former he had acted as Trustee of the Synagogue, built in Wellington in 1868, and for the latter he had been involved in many activities including shipping, railway development and the Wellington Gas Company, as well as the Chamber of Commerce of which he was Chairman. He had become 'as prominent as he was esteemed in the highest commercial and social circles' of what was a very small community.¹⁴

In 1893 Joseph Nathan's wife, Dinah, died of cancer (on board the *SS Kaikoura*). They had been a happy and devoted couple, and he always said that he owed much of his success to her sound advice. Her death, at the age of 53, was a severe blow. From 1887 the Nathans had divided their time between Wellington and London and after Dinah's death, Joseph spent an increasing amount of time in England, which by 1900 had become his home.



His house in London was 23 Pembridge Gardens, behind Notting Hill Gate. It was an area favoured by rich colonial Jews: Sir Julius Wernher's father-in-law, James Mankiewicz, was a resident, Sir Edmund Davis, the Rhodesian base-metals tycoon married from 8 Pembridge Square in 1889, and Sir Ernest Oppenheimer of De Beers Diamonds lived at 32 Pembridge Square in the mid-Edwardian period. Nor was it a coincidence that the house was only a minute's walk on the Sabbath from the St Petersburg Place Synagogue, for Joseph Nathan's Judaism was precious to him, and he insisted that his children be meticulous in their practice of its rites. His outlook is well conveyed by a letter that he sent to his sons after making his final will in February 1903. With its precarious spelling, and indifference to punctuation, it gives a keen flavour of the man.

'My Dear Sons', he wrote:

I have today signed my will in it I have tried my best to be equitable towards all my dear children I feel the Great God of Israel has been pleased to bless me abundantly. He has blessed me in my children all of whom are good & loving.

After explaining the provisions that he had made for the future division of profits from the family firm, he continued:

we are only Trustees all is not given us for our own use to be used only for selfish pleasure all my life I have held these views & have done my best to carry same out sharing with others, seeking where help was wanted & acting according to the judgment vouchsafed to me, do you likewise you will find happiness in helping

others – The possessions God places in your hands is not all for self I wanted to impress this on all of you I hope each and all of you will at all times feel as I have felt that it is a blessing to have been born a Jew be proud of your Birthright and all men will respect you of course you as well as I have learnt will be called upon to make sacrifices for your religion, do it with pleasure, & esteem it a privilege & God will bless you as he blessed your fathers at all times.

I need not tell my sons that Honour truth & integrity are sure roads to success because they are Thank God all Honourable Men.¹⁵

The *credo* had its effect on those of the Nathan sons who were to be most involved in the development of Glaxo Laboratories, notably his sixth son, Alec (1872–1954).

Before what can only be described as his semi-retirement in England – for Joseph Nathan did not find it easy to relinquish the reins – the family firm was converted in 1899 into a limited liability company, Joseph Nathan & Company. Even before this transaction there were divisions between the brothers, and misunderstandings between the Wellington and London Offices. In 1897 there was a serious row between David (1858–1920) in Wellington, and his brother Louis (c. 1860–1933), who was about to take over the running of the London office, now at 17 Fenchurch Street. Henry Isaacs, whose daughter had in 1894 married Maurice Nathan (1866–1949), retired in 1898. David opposed various financial proposals made in London, particularly the valuations put on stocks and on New Zealand properties in the accounts. As the eldest surviving son, David had been a great support to his father during difficult periods in the 1880s, and was accustomed to considerable responsibility. He felt threatened by the admission to the firm of his younger brothers – Maurice and Philip – with ideas of their own, and he was particularly apprehensive that Louis was seeking to cut him out. The breeze between them in 1897 was the precursor of many such storms in the next quarter-century.

The negotiations between father and sons took almost three years to settle the basis on which the company would be formed. Not only were there difficulties about the division of control between London and Wellington and the valuation of assets, but Joseph Nathan wanted to secure an income for his three unmarried daughters of £500 each a year. This was eventually achieved by an understanding that the managers (the brothers David, Louis and Maurice) whose own remuneration depended on the profits of the company should ensure a 5 per cent dividend on the Preference shares (£27,000). With a capital of £127,000 the company was registered in July 1899. Joseph wrote to his sons in November of that year:

I have I really believe made the Company a present of over £20,000 by under-estimating the value of my assets . . . I hope to see Philip and Charlie become joint managers [Philip became a Managing Director in July 1900] with you, before placing either such position you will make them acquainted with the contents of this letter so

that they become parties to it and take their share of responsibility. Let it be explained to them that their sisters portion was retained in the Company to give the Company more financial strength.¹⁶

In the absence of figures for the years before 1899, it is impossible to judge whether the company's performance improved in the five years 1899–1903. Profits were modest – they averaged £8,647 a year in that period – and the company was cautious in the dividends which it declared. It was to need such financial strength as it had husbanded for the new venture on which it embarked in 1903.

The Nathans and proprietary foods 1903–1918

Milk preservation and proprietary babyfoods

For more than fifty years the idea of preserving milk either by canning or drying had attracted the attention of chemists and manufacturers. The problem of supplying fresh milk to urban areas in England which, in the first half of the nineteenth century stimulated the search for a means of preservation, had to some extent been solved by the development of the railway network. But milk supplies in town remained of poor quality, frequently adulterated and, as was increasingly recognised towards the end of the century, the carrier of many diseases. At the same time breast-feeding of babies declined both among working-class mothers, who were employed in greater numbers in factories, and among middle- and upper-class mothers who were disinclined to feed their babies naturally.¹ Attempts to manufacture dried powdered milk failed to produce a form capable of satisfactory reconstitution before the end of the century, but improvements in the technique of 'condensing' milk led to the Borden patent, granted in the USA in 1856. It was not, however, until 1865 that American financial interests formed the Anglo-Swiss Condensed Milk Company (later Nestlé), based in Switzerland where it began operations the following year. By the early twentieth century Anglo-Swiss had opened further factories in Britain, Ireland, Denmark, Norway, Bavaria, the Netherlands, France, Austria and Italy, and a host of imitative competitors had arisen. The most reputable brands of condensed milk at that time were Ideal, First Swiss, Peacock, Viking and Hollandia, all containing about 10 per cent each of protein and fat, and 15 per cent of sugar.² Other condensed milks, of which the more respectable brands were Milkmaid and Nestlé (both made by the same company), had very large quantities of cane sugar added to prevent bacterial growth.

The use of canned condensed milk, particularly for feeding infants, increased rapidly after 1870; imports into Britain rose from 545,000 cwt in

1895 to 919,000 cwt in 1901 and 991,000 cwt in 1909. But although condensed milk was bacteriologically purer than fresh cow's milk, it had many disadvantages. Its liability to contamination after tins had been opened made it a dangerous infant food, especially during summer months; and its nutritional value was low, both in the full-cream and the skimmed milk versions. Because condensed milk was deficient in fat, low in protein, lacking freshness and with excessive sugar content, babies overfed on it were more vulnerable to a variety of diseases including epidemic diarrhoea, anaemia, rickets and bronchitis. The excess sugar could also cause flatulent distention of the intestines, leading to hernia; as Sir Arthur Newsholme, Principal Medical Officer to the Local Government Board (forerunner of the Ministry of Health), cautioned in 1911, 'there are serious drawbacks, except as a temporary expedient, of full-cream sweetened condensed milk as an infants' food, the most objectionable feature being the excess of sugar; but the use of skimmed condensed milk for the same purpose implies a slow process of partial starvation'.³ Another authority wrote in 1909 that 'a veritable holocaust of infants has been due to condensed milk, either directly or indirectly, in consequence of the various ailments which they might have escaped if they had been brought up on a proper diet'.⁴ There was a particular need for a milk suitable for infant feeding during the season of summer diarrhoea (from July to September each year), when cow's milk was 'often dirty, lacking in freshness, kept from going sour by the addition of preservatives, contaminated by faecal matter at the farm, by dust on its journey to the retailer, and by flies while exposed in bowls on the shop counter of a general dealer'.⁵

As well as condensed milk, there were various types of humanized and desiccated (dried) milk available. Humanized milk was chiefly used for nourishing bottle-fed infants, especially during epidemics of summer diarrhoea; comprised of milk modified by the addition of water, cream and sugar, it was dispensed in separate bottles for each feed, the quantity and strength varying with the age of the child. Although it secured 'uniformity and regularity' in infant feeding, safeguarding the child 'against an ignorant or careless mother, as well as against bacterial contamination', there were many practical disadvantages. Its production required special machinery, and hence a capital outlay at which many municipal authorities balked either because of parsimony or lack of resources. Even greater continuous expenditure was entailed by washing bottles, bottling and replacing broken bottles. Moreover, freshly humanized milk had to be supplied to infants daily, so a municipal depot could only serve 'a comparatively small area in its immediate vicinity'.⁶

Although desiccated milk had been in use since the 1870s, in making milk-chocolate or malted drinks such as Horlicks, the process involved treating

skimmed milk which was markedly deficient in fat, and usually required the addition of preservatives. Moreover, these early types of dried milk were limited to factory processes, and could not be reconstituted as milk. Throughout the 1890s there had been attempts to develop a dried milk which would retain all the milk solids and become soluble on the addition of water. All the attempts were based on evaporation at moderate pressure, usually after the addition of sugar, and each one had failed: either because the product quickly went rancid, or because its albuminoid elements decomposed. Rancidity was the real problem. It seemed impossible to prevent butter-fat from going rancid if a full cream powder was sought and, without a full-cream content, the product would be too low in fat to use as a baby food.

The Nathans' acquisition of the Just-Hatmaker process

Early in 1903 Maurice Nathan called at Frank Debenham's department store in Wigmore Street, London. Debenhams at that time had a substantial drapery wholesale export trade and a piece of this business with Nathan's had gone awry. Maurice had a long interview with Debenham's elegant and supercilious managing director, Fred Oliver, who was the most powerful right-wing pamphleteer and polemicist of his day.⁷ When this interview was concluded, Ernest Debenham took Maurice aside and displayed a parcel of skimmed milk powder. The powder had been made under a high temperature process for drying milk, the British patent for which was held by an American called James Robertson Hatmaker, with whom Oliver was discussing its possible exploitation in Britain. It is not clear how far Hatmaker and Debenham's had advanced in their negotiations, or when they had been introduced. Debenham's motives in showing the powder to Maurice Nathan are equally unclear and may have been casual. Whatever was intended, Maurice Nathan immediately recognised that the powder offered a solution to his firm's long-standing dilemma of utilising the surplus skimmed milk produced at their New Zealand creameries and butteries, by turning it to productive use as powdered milk. There is one tantalising reference to an earlier interest on the part of the Nathans in dried milk. In 1901 David Nathan had taken samples of dried milk made at the Makino butter factory to the Manawata Agricultural Show, in the hope of persuading farmers that it was a better business proposition than butter or cheese. Nothing further, however, seems to have come of it.⁸

The new process being touted by Hatmaker to Debenhams had been developed by two New York dairymen, John A. Just and Roy Bent and was known as the Just-Hatmaker method. Its use of high temperatures to dry the milk was a novel departure from the prevailing slow vacuum process and,

in 1903, having only undergone laboratory testing, it remained unproven commercially. Just and Hatmaker had not then perfected their method of separating the dried milk power from the cylinders on which it had been heated (see page 23), and it was only later in 1903 that an English mechanical engineer, John Merrett, working for German paper machinery makers near Mannheim, devised a knife to remove the film of dried milk from the heated roller.⁹

Initially, when Maurice Nathan discussed the possibility of exploiting the Just-Hatmaker process in collaboration with the Debenhams, his father and brother Louis dismissed it as impractical. Maurice then left for Canada to deal with the firm's supply problems in tinned fish and flax, expecting his suggestion to recede into oblivion. In his absence, however, Joseph and Louis Nathan revived interest in the idea and resumed discussions with the Debenham family. 'At this time', so Alec Nathan and others recalled in later years, the London directors 'thought J.N. & Co had a gold mine in the Dried Milk business', and flung themselves into it with high enthusiasm.¹⁰

In the summer of 1903 Frank Debenham signed a series of agreements with Hatmaker, who held various international dried milk patents outside Canada and the USA, by which Debenham bought the manufacturing rights of the Just-Hatmaker process in Argentina, Brazil and Uruguay, and the right to import the product into Britain. The Dried Milk Company was registered in London in November 1903, with a nominal capital of £100,000. Frank Debenham and Louis Nathan were among the directors, the latter subscribing for 250 shares and Ernest Debenham for 2,500. Another company, the Dried Milk Company of Australasia, was registered in January 1904, to acquire the benefits of Hatmaker's dried milk patents in Australia and New Zealand, and again the Debenham and Nathan families were the main shareholders (the Nathans took 900 shares). In 1904 an additional 18,000 shares in the original company were issued to Hatmaker himself, and another 750 to Algernon Blackwood, the Marquess of Dufferin and Ava's literary kinsman, who was dabbling in the business.

The Nathans and Debenhams were not, however, the first in the United Kingdom to adopt the Just-Hatmaker process. Machines built under the patent had already been erected at the Cow & Gate Dairy at Sherborne in Dorset, while other machines were bought by firms at Edinburgh, Cheshire and Charleville in County Cork. From the outset this diversification was troubled. Hatmaker seems to have been greedy, sly, argumentative and preemptory. He received £8,000 for expenses from the London Dried Milk Company as well as £50,000 in shares credited as fully paid (although some were apparently issued for 'other considerations'). His contracts entitled him to £10,000 in cash and £18,750 in shares from the Australasian company. But in fact Hatmaker had merely acquired the foreign rights of the

developers, Just and Bent, and Debenham's own agreements with Hatmaker were not ironclad. By August 1904 the latter was demanding a minimum guaranteed royalty from the Australasian subsidiary, which Nathans were not prepared to give. As Maurice recalled forty years later:

the old man and Louis were in such a state about the business . . . Eventually I got a shrieking telegram to come [back from Canada] at once. When I got back I saw father and Louis broken down: they had fallen in with a man named Hatmaker, who was one of the worst type of Americans I had come across. They wanted to chuck the whole business in and give up. My answer was NO! 'You sunk £5000 into it and we cannot afford to lose it.'

A complete breach between Hatmaker and his British associates occurred in 1905.

In January 1905 the Nathan family registered the Imperial Dried Milk Company in London, with Joseph, David, Louis, Maurice and Philip Nathan as the five shareholders, subscribing £4,000 each in cash.¹¹ Imperial acquired their rights in the previous two companies, which were voluntarily wound up later in the year as being unable to trade profitably. Joseph Nathan & Co also lent £20,000 to Imperial Dried Milk, secured by an overdraft from the Union Bank of Australia. Hatmaker did not, however, relinquish his legal vendetta against the Nathans and, following a petition by him, the Imperial Company was put into receivership in February 1909. On this liquidation, Joseph Nathan & Co were granted all Imperial's assets in settlement of its debt of £20,000 and in turn Hatmaker, in April 1909, terminated his licensing arrangements for the export of Australasian milk powder to Britain. The Nathans ignored this and continued with the business, although Hatmaker's legal action for infringement of his patents was not finally defeated until the case reached the House of Lords in 1919. Despite all this legal mischief, the Nathans were free to develop the business on a more sound and systematic basis.

Dried Milk, 1904–1908

Although it seems unlikely that they realized it at the time, the Nathans had, by the purchase of the Just-Hatmaker patents, moved into a wholly new area of business. It was one for which they were ill-equipped and ill-prepared. The first essential was to get the manufacture of dried milk started in New Zealand. For this the company turned to Joseph Nathan's two youngest sons; with five sons already in the business, they, it had seemed, were not needed and Frederick Nathan (1871–1938) and Alec Nathan (1872–1954) were farming together at Palmerston North. They responded to the call and Fred took charge of the creameries in 1904, while Alec was made responsible for the dried milk operations. Hatmaker's engineer, John



5 The Bunnythorpe factory *c.* 1904, showing the Defiance brand name.

Merrett (see page 20) was sent out to New Zealand, in January 1904, to supervise the erection of the new dried milk plant at the Nathan's butter factory at Makino. As Merrett later recalled, the New Zealand 'Nathans had not the slightest idea of what they were expected to do nor had they any policy or plans for the new venture'.¹² Production under the Just-Hatmaker process nevertheless made a faltering start in a small room at Makino in May 1904 and, in June, David Nathan arranged for a special train to bring more than 200 farmers and others to inspect the new process. It was soon realised, however, that the milk-drying at Makino could not be extended without disrupting butter production at the factory, and the decision was taken to erect a new dried milk factory at Bunnythorpe in the rich dairy farmland near Palmerston North. Merrett drew up the plans and supervised the erection of the timber and corrugated iron building, where operations began in October 1904. The first season's output amounted to some 200 tons of dried milk.

Under Hatmaker's original patent of 1903, two hollow metal cylinders were arranged to revolve in opposite directions, and mounted so as almost to touch one another. The cylinders were internally heated by steam until their surface temperature exceeded 100° centigrade and they were revolved between six and fourteen times a minute. Liquid milk was poured into the hollow between the two hot and revolving cylinders: the water content

immediately evaporated, leaving a tissue-thin sheet of dried milk which after two-thirds of a revolution, was scraped off by knives. The resulting dried milk particles were then passed through a sieve to obtain a uniform, finely granular powder. The period of heating in this simple process was extremely short, and therefore altered the composition of the milk solids comparatively little. This was a matter of outstanding importance, for the dried milk retained all the benefits of humanized milk for the infant while destroying tubercle bacilli and other pathogenic organisms.

But there was still one major problem with the process, sufficient for Alec Nathan to consider that his family had been 'daft' to buy Hatmaker's process for £10,000 in cash. In later years he noted that 'they had bought a dud'. When the reconstituted milk was still hot it closely resembled milk, but when it had cooled, casein (the phosphoprotein precipitated) fell to the bottom of the glass while a sickly green whey rose to the top. 'If we had had sense enough to employ a first-class technical chemist, we might have got that right pretty shortly, but we did not', was Alec's retrospective verdict. Instead it took almost four years of continuous experiments by Alec and Fred Nathan to manufacture a milk powder that was soluble and did not separate into casein and whey. It also had to have keeping properties extending to some months. The initiative and technical expertise needed to refine and develop the manufacturing process came from John Merrett, aided by the Nathan brothers. Together they elaborated *ad hoc* improvements as their experience of output increased. The credit for the modifications to the original Just-Hatmaker drying process cannot be allotted with certainty, but largely belongs to Merrett and Alec Nathan; the London managers and directors had neither time nor inclination to offer suggestions.

The Nathans' refinements of the Just-Hatmaker process improved hygiene and produced a powder that would keep for longer than its competitors without a serious loss of flavour. They took their New Zealand milk supplies from tuberculin-tested cows farmed at close proximity to their factories. The cows were milked straight into closed vessels and the milk was delivered to the Nathans' factories within three hours. On receipt it was tested for acidity and, if found to be excessively acid, the farmer received a lower price and the milk was used for making cheese (a cheese-making factory was added at Bunnythorpe in 1906). Next, the milk was put through a special filter to remove dirt: it was then cooled and kept at a low temperature in insulated vats. Afterwards it was tested for its total solid content and standardised by the addition of lactose and butter fat. The drying process was done without delay, and the powder was then swiftly packed in hermetically sealed tins holding 50 lbs each.

Unfortunately there is no surviving account of this crucial period in which the Nathans were transformed from dairy distributors and exporters into

manufacturers using a pioneering process, improved on by their own research and development. It can only be emphasised that the original drying plants were small, comparatively simple and geographically remote. It is not surprising that, in these circumstances, records of the technical improvisations and of other organisational arrangements do not exist. Some of the equipment was at first sent from England. The Board minutes of Joseph Nathan & Co reported on 1 January 1904 that four drying machines, two boilers, one chimney and one feeding pump had been purchased and shipped to New Zealand for the dried milk business.

According to the engineer, Merrett, the most troublesome part of the process in the pioneer days came in packing the finished product into tins. Originally twenty girls from Wellington were recruited for packing and labelling, to be replaced after a few years by American machinery which automatically weighed and packed the powder. Another difficulty was that local farmers possessed no coolers and needed persuasion to deliver their milk without delay after milking; for it was essential that the milk to be dried was completely fresh.

Nevertheless, despite all this technical ingenuity, the business only developed slowly as Alec later wrote:

It is a curious and interesting fact that the Nathans thought when they purchased that patent, that their fortune was made and that dried milk, with its convenience and adaptability would replace liquid milk, and their disillusionment was very costly. When first Dried Milk was put upon the New Zealand market, there was an enormous rush to purchase supplies, which confirmed the Nathans' idea that a fortune was waiting at their door to be picked up. However, they were too ignorant of Proprietary Article Trading in those days to realise that that was a 'curiosity' demand, and they waited impatiently and fruitlessly for the repeat orders to come. Again, they were not experienced enough or wise enough not to manufacture until those repeat orders did come, but they went full steam ahead on the basis of this 'curiosity' demand to manufacture, and when it did not materialise, they found themselves with a very substantial stock of dried milk that was unsaleable, nor was there any substantial sale for it in England. They did not know how to create a market for it as household milk, so they were forced to try to sell it to biscuit makers and confectioners. To them it was a novelty; they had no recipe for the incorporation of dried milk in their biscuits or sweets and in those days manufacturers were not as enterprising as they became later, nor had they chemists or research workers on their staff, so it was an extraordinarily slow process to get them to experiment and use any material quantity.¹³

Before considering in detail the Nathans' development of their dried powder milk business, which began so inauspiciously, it is worth looking at the British market at which they were aiming. An advertisement in the *Daily Express* of 16 March 1904 by the Galak Milk Products Company (probably, but not certainly, representing the Debenham and Nathan families) of 118

Fenchurch Street, using the Just-Hatmaker process, is explicit. It was headed:

LONDON'S MILK
"AN APPALLING STATE OF THINGS"

No Direct Control

We must not send any of our milk to old customers, since the place has been condemned. Never mind, there is a splendid market in London. It is good enough for London

The six million inhabitants of the metropolitan area will be startled to learn that this remark of a large provincial milk-seller expresses the almost general attitude towards the milk supply of London.

Quoting a Medical Officer of Health as saying that control over the London milk supply was 'terrible' and 'appalling' in its deficiencies, it warned that there 'was a disgraceful traffic' in diseased milk; as evidence a report was offered on Staffordshire dairy farms, which had said that 'most cowsheds are ill-lit, over-crowded, badly ventilated and badly drained'. The advertisement also condemned the 'pernicious effects' and 'curious facts' concerning the adulteration of milk and other food with preservatives. What was worse, according to Galak Milk Products, was that:

In many cases a large milk producer is one of the chief men on the local council, and the medical officer of health who fearlessly does his duty in protecting the health of the community may have to condemn that man's cowsheds and methods. He must often have to choose between winking at the evil and being dismissed . . . general tuberculosis affects more than 30 per cent of the milch cows in the country. Yet we go on allowing the children of today, the solidiers, inventors, thinkers, and workers of tomorrow – the British nation of a few years hence – to drink this milk. No wonder that there is a continuous battle against consumption and typhoid, diphtheria and scarlet fever.

The alternative, according to Galak, was obvious. 'By the Just-Hatmaker process of drying milk we produce Pure, Soluble Dry Milk, which is absolutely sterile and odourless', they declared; and a photograph of the process in action was captioned 'The wonderful machine which, in less than 30 seconds, reduces liquid milk to a fine sheet of dry powder'.¹⁴ The Galak advertisement strengthened its case by publishing the tables showing the extent of the adulteration of milk, which was at its highest on Sundays. The position was worst in London where Galak's figures showed that nearly 16 per cent of milk was adulterated, a figure which came down to around 10 per cent in the twenty largest towns in the rest of England and Wales.

The advertisement suggests that at this stage, the Nathans were aiming to supplant household milk in its entirety, rather than marketing it specifically as baby food. The chronology is unclear, but Galak seems to have been