The Royal Mint Refinery, a Window onto the London Gold Market

By Dr Michele Blagg, visiting Research Associate at the Institute of Contemporary British History, King's College London

Tim Green, in his recent publication 'The London Good Delivery List: Building a Global Brand' (2010), provided a detailed account of the expansion of the London refining industry following the 'gold rushes' that took place from the mid-19th century and resulted in many new refining houses and brokerages being established in London. Inspired by Tim's research, Dr Michele Blagg built on these accounts for her own research. Here she presents a précis of her doctorial study into a bullion refining facility, the Royal Mint Refinery, operated by N M Rothschild & Sons between 1852-1967. The study, which focused on the interaction between Rothschild and the London gold market, reveals much about the significant players in the industry and contributes to the wider understanding of the current renaissance for gold.

Gold is a commodity like no other. In the twentieth century it held a unique position at the heart of international relations and financial flows in monetary systems around the world. It was the favoured commodity of the merchant bank N M Rothschild & Sons and complemented its business activities. Niall Ferguson, in The House of Rothschild, suggested that Rothschild was never 'jacks of-all-trades'.1 He described the preference of the merchant bank as specialist in a number of select markets, the aim being to establish a 'dominant role' in each.2 Throughout the 19th century the bank's relationship to gold was secured through its ability to supply consignments of bullion to governments at short notice and in large quantities. Rothschild reinforced its position to gold with a succession of investments and expansion in relations with overseas mining enterprises that maximised its command over precious metals. One such enterprise was that of the Royal Mint Refinery, a gold and silver refining facility. The prospect of taking on the refining business appealed to Rothschild who saw great opportunity in operating a refinery treating much of the bullion sent to the London market from around the world. The responsibility for the negotiations fell to Anthony de Rothschild (1810-1876), one of the sons and business heirs of N M Rothschild, who secured the lease from the Government in January 1852. The decision to add the word 'Refinery' to the previous title of the Royal Mint was a fortuitous one, affording Rothschild an element of anonymity.3 The 'RMR' brand was internationally recognisable and accepted by central banks and private investors as 'good delivery'.

One challenge in gaining a better understanding of the London refining industry was to raise the veil of secrecy and mystery that surrounded it. Many of the daily operations were performed

behind closed doors, for reasons of security and the protection of secrets in the treatment process, these the Refiner "jealously and carefully" kept to himself. Another hurdle was appreciating what attracted gold to the London market. Market intelligence played a key role in Rothschild's success. In 1848 Alphonse

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de Rothschild (1827-1905) on a trip to New York wrote back to the Paris house that 'there is much sensation as to the gold mines in California. It seems one only has to go down and pick it up.'5 From the Cape in 1888 he wrote to his cousins in London of:

"the amazing stories of the riches in abundance of mining in the Cape... to listen to some of them this country has got treasures within reach as real and comparable with those of Aladdin's grotto. The gold arriving in Europe should greatly please the Bank of England."6

An associate of the bank, Carl Meyer had no hesitation in promoting the Cape to the London house. In his opinion 'these fields have an enormous future before them' and 'the country together will for the next 10 or 20 years offer greater scope for European capital than South America and similar countries.'7

In 1868 Ernest Seyd noted that 'when large refineries are carried on in connection with banking, bullion operations have an influence on the supply and demand of the precious metals in the market and thereby yield indirect profits.'8 Certainly Rothschild took full advantage of the gold rushes of California, 1848, Australia, 1851, and South Africa, 1884. The bank also benefited from its connection to the Royal Mint Refinery as it gained access to and control over much of the gold production within the British Empire, which in 1914 amounted to a massive 70 per cent of the total world gold production.9 Gold refining facilities in London were regularly improved and expanded in response to the arrival of African gold, and the silver refinery received constant supplies of demonetised coin from across Europe.

In earlier years large shipments of bullion arrived in London in the shape of blocks; bars; ingots; pieces and coins; or in any other form in which it could be offered up to the market to be sold for the intrinsic metal value.¹⁰ London refining firms competed against each other to secure the weekly consignments of raw gold that were boxed up and transported by coach, later by rail, to Cape Town and Durban and dispatched by ship to London. Directors of the companies donned 'their frock coats and top hats and headed into the City each morning to call on the banks, brokers and shipping agents to compete for the incoming shipments'.11 Upon arrival the wooden boxes containing the raw gold were dispatched to the various refining houses for treatment. Once refined the bars were converted into the finished product ready for sale as pure gold and offered for sale on a Monday morning in the London market by one of the approved bullion brokers.12 In addition to refining costs gold producers were also responsible for freight charges, insurance,

¹ Niall Ferguson, *The House of Rothschild, Money's Prophets,* 1797-1848, Vol. 1 (New York: Penguin Group, 1998), p. 276

² Ibid.

³ C. E. Challis, A new history of the Royal Mint (Cambridge: Cambridge University Press, 1992), p. 502.

⁴ Ernest Seyd, *Bullion and Foreign Exchanges* (London: Effingham Wilson, 1868), p.198.

⁵ The Rothschild Archive, London (RAL), T49/49,

^{&#}x27;Alphonse, New York, to Paris House', 5 Dec 1848. 8 RAL, T43/8, 'Alphonse to NMR', 29 Dec 1888.

⁷ RAL, T43/3, 'Carl Meyer to NMR', 26 Mar 1892.

⁸ Seyd, Bullion and Foreign Exchanges, p. 199.

C. R. Whittlesey, 'The Gold Dilemma' Quarterly Journal of Economics, 51 (1937), 581-603 (p. 598).

¹⁰ Timothy Green, The History of the London Good Delivery

Gold List, 1750-2010 (London: LBMA, 2010), p.21.

11 Donald McDonald, The History of Johnson Matthey and Company: Vol 2, The Years of Building (London: Private Publication, 1974), p. 104.

¹² From 1850 the four bullion brokers that acted in the London Market were Mocatta & Goldsmid, Pixley & Abell, Samuel Montagu & Co., and Sharps & Wilkins.

and any brokerage fee charged for the sale of the consignment. Jean Jacques Van-Helton calculated that additional costs incurred could be in the region of 15 per cent, which meant that the standard price of an ounce of gold (£3 17s 9d) could be whittled down to around £3 10s.13

Gold received in London, mainly originating from southern Africa, was channeled through a variety of formal and informal links. Between 1904 and 1910 imports increased from £16.3 held their annual general meetings, credit and overdraft facilities were arranged with banking capital against anticipated revenue from weekly gold sales. Finally, and more importantly for the London refining houses, the Transvaal possessed no Mint or refinery, and as such British banks and other South African states and colonies would not recognize a Transvaal hallmark or coins minted in Pretoria.17 With no established refinery shipments of raw gold continued to flow to London for treatment.

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Refinery, implemented a series of improvements from 1905 and after adopting the new chlorine method of refining, advanced in Australia since 1870, much improved the operation. Machinery and facilities were upgraded and he boasted that 'my refinery is forging along nicely'.23 The upgrade offered a shorter processing time and thus reduced overheads and lowered refining costs. The firm's refining capabilities increased from 3.3 million ounces gross weight of gold to 6.8 million by 1913.24 Charles noted that the gold bars produced in London were 'works of art'.25

Benjamin White provided a rare insight into the physical layout, management and daily operation of the Rothschild refinery. Following a visit to the refinery in 1912 he wrote that:

"The exterior of the Refinery is lofty and massive, and the visitor, as he passes through a wicket-gate in the huge doors, receives a first impression of security and space. As [he] crosses the ample yard and becomes conscious of a somewhat sickly pungent smell, regarding which he is informed, casually, 'Oh! That is only [sulphur dioxide].' The first room, about forty feet square, is used for weighing; six large balances within glass cases range the walls, a counter occupies the centre, and stacks of silver bars, fine and otherwise, are on the floor. The actual refining takes place in a fine central hall, with annexes where minor details are dealt with. Five sets of apparatus stand side by side, each composed of a series of three tanks, two covered and on a high platform and one uncovered on a lower level. The liquid, with precious metals held in solutions, flows down to the lower tank, which measures about 12 feet by 6 feet and is about 3 feet deep. From the open tanks steam rises in clouds, for the contents are heated to 1000 degrees Celsius and the tanks are continually stirred with long poles to assist the action of the acid. The sulphate of copper in the solution gives a beautiful blue tint to the contents."26



Picture 1: Unpacking of raw gold from abroad at the RMR, circa 1933.

million to £34 million.14 Clarke suggested the attraction to London was 'simply a reflection' of the City as a wholesale market with builtin expertise and experience.15 Van-Helton identified four key links that attracted gold to the London market. $^{\rm 16}$ Firstly, the London gold market was the only genuinely unrestricted market; it was free from 'gold premiums, central bank interventions and so on, nothing impeded the import and export of precious metals.' Secondly, as a consequence of the Bank Charter Act of 1844, London provided a guaranteed market and minimum purchase price for gold (£3 17s 9d an ounce). Thirdly, the City was the hub of global patterns of trade and payment flows, with its myriad of financial institutions and other services it provided the Witwatersrand mines: insurance: brokerage: Stock Exchange; banking; refining facilities; recruitment of technical personnel; and the bill on London was an internationally acceptable means of payment. Moreover, in the City the majority of mining companies were incorporated as limited companies, raised working capital on the Stock Exchange, had head offices there and

By the turn of the 20th century the flow of gold to London had increased so much as to fill capacity the refineries and competition became meaningless.18 The three principal London refining houses, Johnson Matthey & Co., the Rothschild Royal Mint Refinery and H L Raphael & Sons¹⁹ were kept busy despite growing competition from German refineries that offered tempting rate reductions in a bid to steal business away from London.20 On 31 December 1906 Johnson Matthey, Rothschild and Raphael entered into a formal agreement that fixed the treatment price of gold in London at 3d an ounce. It was agreed that all gold entering London would be divided between the three firms in more or less equal portions.21 The agreement remained in force until the outbreak of war in 1914. During this period Johnson Matthey increased its own treatment capability and entered a period of modernisation by acquiring the British rights to the new electrolytic process, developed in Hamburg, which was later replaced in 1913 by a gas-fired melting house.22 Not to be outdone Charles Rothschild, who had taken a keen interest in the Royal Mint

¹³ Jean Jacques Van-Helton, 'Empire and High Finance: South Africa and the International Gold Standard, 1890-1914

African History, 23 (1982), p. 538. 14 John Clapham, The Bank of England: A History, Vol. 11, 1797-1914 (Cambridge: Cambridge University Press, 1944) n. 378.

¹⁵ William M .Clarke, The golden thread: World Financial Centres and the Gold Connections (London: Sweet & Maxwell ltd., 2001), p. 64.

¹⁶ Van-Helton, 'Empire and High Finance', p. 539.

¹⁸ McDonald, History of Johnson Matthey, p. 104.

¹⁹ By 1919, a consequence of wartime restrictions, the Raphael refinery had been turned over to the production of motor vehicles. However, the venture did not prove lucrative and production ceased in 1926; see Stanley Chapman, Raphael Bicentenary, 1787-1987 (London: Raphael Zorn

²⁰ In 1899 by the Deutsche Bank and German refinery, the Deutsche Gold and Silberscheide Anstalt, in an attempt to steal business away; mining companies were offering a considerable reduction on shipping and refining costs; see

Van-Helton, 'Empire and High Finance', p. 537. 21 McDonald, *History of Johnson Matthey*, p. 104.

²² RAL, 000/1242, Spencer Richard, 'The Royal Mint Refinery in the Twentieth Century', 1990.

²³ RAL, 000/1323, Letter book 'N Charles Rothschild to Hugh Birrel', 21 Jul 1905.

²⁴ RAL, 148/24/3, 'Treatment of Silver & Gold 1905-1948.' 25 RAL, 000/1323, Letter book 'N Charles Rothschild to Hugh Birrel', 15 Oct 1905.

²⁶ Benjamin White, Silver, Its History and Romance (London: Hodder & Stoughton, 1917), pp. 97-8

His guide was George Buess, refinery manager 1912-1937. White noted the 'courtesy of the manager, his anxiety to explain the process and his perfect mastery of the details showed that his interest charge was by no means regarded in the light of a mere duty.'27 While he suggested that 'the upkeep of such an establishment as a refinery, quite apart from its commercial character, [was] a source of legitimate pride to its owners.'28 Security arrangements did not escape his notice as he recalled that 'around the central apparatus lies precious material in various stages of purity. The exposed heap of fine gold, in appearance like wet clay sand, demonstrates the need for perfect confidence between employer and employed.'29 The matter of security was inherent to such an operation as an earlier account by Ernest Seyd demonstrates: The uninitiated might be led to think that the workmen in a Refinery, where such large masses of Bullion are under their hands, could pilfer without detection. The exact quantities of gold and silver present are, however, known with almost mathematical accuracy, and the precious metals pass from hand to hand, or in the charge of foreman, in such a way that robbery becomes almost impossible, or is, at least, at once detected.30

It was not merely confidence between an employer and his staff that was required but an effective deterrent and anyone caught stealing was immediately dismissed and the matter pursued through the courts.

The turning point in the fortunes of the London refining industry came in 1919. It was announced that a native refinery, located in southern Africa, was to be established, thus at some point the hegemony enjoyed by the London refiners would be called into question. Almost certainly the outbreak of war in 1914 delayed the transfer. Evidence records growing discontent amongst many gold producers at the refining costs charged in London. This, coupled with the general discord as peace returned, provided the catalyst for the post-war change; the inert price for gold during the conflict, together with rising production and wage costs, reduced profit margins, fuelled greater support for autonomy amongst the producers and revived calls for a native refinery.

Reactions in London to the news of the new African refinery were mixed. Sir Lionel Phillips, London representative of the Central Mining & Investment Corporation Ltd., urged both Johnson Matthey and Rothschild to become involved in the running of the new overseas operation. Johnson Matthey was keen to take up the offer and encouraged Rothschild to join them. Rothschild had already reviewed its options and for reasons of security, in addition to the challenge involved in establishing and



Picture 2: Royal Mint Refinery staff circa 1897

operating a refinery at such a distance from London, took the stance that 'there is no advantage in helping the South Africans to cut our own throats.'³¹ Instead it was decided that both refiners would reduce treatment costs, however at the Bank of England a different strategy was conjured up.

Dr Rachel Harvey, in a recent article in the Alchemist (65: 2012), looked at the early development of the London Gold Fixing and discussed the strategy formulated at the Bank of England as it attempted to control and manipulate international supplies of gold, to ensure that once gold was refined in South Africa it would continue to be marketed in London. The result was the introduction of the daily London Gold Fixing. It was the role of N M Rothschild & Sons as banker, refiner and main agent for the South African mining companies that led to the firm being invited to act as the market's chairman. Another strategy introduced at the Bank of England proved more risky and unsuccessful. In order to build greater links with gold producers, hoping that gold might continue to be sent to London for treatment even after the new African refinery was operational. It was decided that the Bank should established its own refinery.32 From January 1919 plans were rushed through and an employee of the Ottawa Mint Refinery, Pearson, was seconded to set up a new facility in London St. Luke's to attract untreated gold, which began operating from November 1920.33 Astonishingly the Bank announced it was prepared to 'refine at cost'.34

Once the Rand Refinery, located near Pretoria, began to operate at full capacity the excellent position enjoyed by the London refiners since the mid-19th century evaporated overnight. One of

the first casualties was the St Luke's Refinery as it became increasingly difficult to attract gold to the new facility.35 Johnson Matthey, faced with the possibility of no gold to treat, suspended its gold refining operation and concentrated on the treatment of platinum that became a permanent and growing service.36 Rothschild continued to treat parcels of gold, although greatly reduced in size, which arrived in London. The operation increased its treatment of silver and also diversified into the treatment of copper foil and other metals. During the 1930s the London refiners received a short reprieve. Following Britain's departure from the gold standard in 1931 the price of gold rose by 40 per cent above the gold currency price in the London market. The inflated price stimulated a wave of new production and caused an avalanche of pre-owned gold to be returned to the refiner's pot to be recast into bullion bars and sold.37 Rothschild benefited from the rise in price as gold requiring treatment was sent to London from areas of new gold production that emerged in west and east Africa.

The closure of the gold market and introduction of government restriction on gold at the outbreak of the Second World War halted business; the industry was forced to mark time until the market reopened in 1954. 38 At the Royal Mint Refinery the renaissance was brief, the operation became a victim of decolonisation and the independence of African states that took place during the 1950s and 60s.

The greatest threat followed the independence of Ghana in 1957. High on the new Government's agenda was the country's departure from the sterling area, regarded in London as 'a simple closure to break colonial apron strings.'39 Before independence the best

²⁷ Ibid., p. 99.

²⁸ Ibid., p. 97. 29 Ibid.

³⁰ Seyd, Bullion and Foreign Exchanges, p. 198.

³¹ RAL,111/152, 'Refinery in South Africa - Proposed establishment', 23 Jun 1919.

³² Bank of England Archive (BEA), C40/305, 'Gold St Luke's Refinery'.

³³ Green, The History of the London Good Delivery, p. 30.

³⁴ Ibid, 35 BEA, C40/305, Telegram 'Chief Cashier, Bank of England to

Pearson, Pretoria, 29 Mar 1923. 36 McDonald, History of Johnson Matthey, p. 60.

³⁷ Comparisons can be made between the experiences of the 1930s and those of the first decade of the 21st century when, following a steep rise in the price of gold from 2008,

the price rise sparked a flurry of media advertisements offering 'cash for gold'. In 1932 collection points were set up in the high street by jewellers and pawnbrokers, who in turn sent parcels of gold for treatment to one of the refineries who were inundated with work.

³⁸ The London Gold Market reopened on 22 March 1954 with a first fix of £12.42.

³⁹ BEA, 0V69/6, Ghana Report, 15 May 1961.



Picture 3: Rand Refinery office and assay office - circa Dec 1921

customer of the Royal Mint Refinery had been the Ashanti Goldfields Corporation. Gold was consigned for treatment on behalf the Bank of West Africa under a 3 year renewable contract at the Rothschild facility. $^{\rm 40}$ Once treated this was sold at the London Gold Fixing. News of the establishment of a state refinery in Ghana meant Rothschild had two options. The first was to establish and operate the new overseas facility on behalf of the Ghanaian Government. This was rejected, for reasons not dissimilar to the firm's earlier rejection of operating a South African refinery; regarding security and the challenges of running the facility such a distance from London, the second was to do nothing.⁴¹ The Ghanaian state refinery opened in 1966 and in 1967 the partners at Rothschild made the decision to sell the Royal Mint Refinery to Engelhard. Whilst it no longer handled the raw commodity, Rothschild protected its position to gold as chair of the daily Gold Fixing that took place at its London headquarters, New Court, until 2004.



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doctoral award granted by the Art's and Humanities Research Council, she was based at the Rothschild Archive, London. Her doctoral research focused on the Royal Mint Refinery, operated by N M Rothschild & Sons between 1852 and 1968, and how it adapted to the changed London gold market. Her areas of interest are in financial and business history with special regard for the actors and networks located in the London market. Her publications include 'Gold Refining in London: The End of the Rainbow, 1919-20' in The Global Gold Market and the International Monetary system from the late 19th century to the present (forthcoming, 2013); 'The Royal Mint Refinery, a business adapting to change' in Business Archives Council, Sources and History. She teaches on the ICBH MA in Contemporary British History and assists with the Witness Seminar Programme. She sits on the Business Archives Council Executive and is involved in the annual 'Meet the Archivists' workshop held in the City that aims to explore ways in which research students can identify and use business records in a variety of different research fields.

As a postscript to Michele's article Stewart Murray, Chief Executive of the LBMA, has also been delving into the archives, and adds some further observations on the involvement of the Royal Mint and the referees in the accreditation process, prior to the formation of the LBMA.

Refereeing the Good Delivery System

Delving into the history of the London Good Delivery List in the period before the LBMA was established in 1987 is always challenging. Although Rothschilds (in its capacity as chairman of the London Gold Market) passed over to the LBMA a number of files on listed refiners, there are many gaps in our detailed knowledge of how many of the accreditations were processed. However, there is no doubt that the Royal Mint Refinery played a key role in the gold market's accreditation process for much of the 20th century.

When the London bullion market reopened after the Second World War, it was recognised that some new refiners would be applying for Good Delivery accreditation and a formal system of technical assessment was required. Earlier. some refiners had been added to the list simply on the basis of being well-known to the members of the London market or at the recommendation of their local central banks. This was the case for instance for a number of French refiners and assayers which were added to the list in 1953. But in most cases, refiners which wished to be added to the list had to undergo technical testing of their assaying ability as well as their ability to produce acceptable Good Delivery bars. At that time, the London Gold Market used two referees to support this work: Johnson Matthey (based on its Royston refinery and laboratory) and the Royal Mint Refinery which was located in the City of London just outside the walls of the Tower of London. At that time the technical assessment procedure involved in the Good Delivery system was significantly different from the one which is followed nowadays.

The two main differences were

- (a) the way in which the assaying test was carried out and
- (b) that the two phases of technical assessment were reversed relative to current practice.

In other words, a refiner first had to submit its bars and only if they proved to be satisfactory (physically and in terms of chemical analysis) the applicant moved to the assaying test. The referees also had to check that the gold when melted poured well and made good bars. It was notable that the referees played a much more important role in assessing physical quality of the bars at that time, whereas today this aspect is primarily the responsibility of a panel of inspectors from the London vaults.

Turning to the assaying test, this was much more onerous for the referees than it is today. At that time, the applicant was invited to manufacture three sets of 24 button samples with finenesses covering the whole range from 995 to 999.9. These samples had to be assayed (using fire assay) by the applicant and by each of the referees. Another difference was that the assays were only carried out to four significant figures whereas today the comparisons are done on a five figure basis. In a sense, the referees were being tested just as much as the applicant. When all three sets of assays were completed a comparison of them would determine whether the applicant was acceptable. This method had a number of difficulties including the possibility that the three sets of samples might not be completely homogeneity.

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When the Royal Mint Refinery was sold to Engelhard Industries in 1968, and following the relocation of the refinery to Chessington (south-west of London) the relocated refinery was technically assessed by Johnson Matthey and by the Sheffield Smelting Co (THESSCO)



Picture 4: Beam balance scale, gifted to the LBMA by Engelhard CLAL

and after its Good Delivery accreditation was confirmed, Engelhard was subsequently recognised as one of the market's two referees. Some time after that date, a decision was made to produce reference samples in the form of rods which could be carefully cross checked between the two referees and from which "buttons" could be cut to send to applicants. These reference samples were used for assessing the assaying ability of applicants for the next 20 years.

When gold refining ceased at Chessington in 1998, Engelhard CLAL (as it had then become) was removed from the active Good Delivery List but because of the excellence of its laboratory it continued to serve as one of the LBMA's two referees until 2002 when the company decided to close the plant, including the laboratory. At the same time, Johnson Matthey announced that it would no longer be refining gold and silver at Royston and that it would step down

as one of the LBMA referees once alternative arrangements were made.

At the end of 2003, following two years of intensive work in the preparation of gold and silver reference samples, the LBMA announced the appointment of five new referees who thus took over the baton from JM and RMR. But that is another story.

As a fitting reminder of the contribution to the Good Delivery List made by the Royal Mint Refinery and its successor, it may be noted that the gold beam balance in the LBMA boardroom was gifted to the LBMA by Engelhard-CLAL when it closed the Chessington operation (see photo).

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