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Britain, industry and perceptions of China: Matthew Boulton, 'useful knowledge' and the Macartney Embassy to China 1792–94

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Abstract

Global history has debated the emergence of a divergence in economic growth between China and the West during the eighteenth century. The Macartney Embassy, 1792–94, the first British embassy to China, occurring as it did at the end of the eighteenth century, was an event which revealed changing perceptions of China and the Chinese by different British interest groups from government, trade, industry and enlightened opinion. Many histories of the embassy recount failures of diplomacy and cultural misconception, or divergent ideas of science. This article examines attitudes of British industry to the embassy through the part played in its preparations by the Birmingham industrialist, Matthew Boulton, and revealed in correspondence in the Matthew Boulton Papers. The article uncovers debate among different interest groups over the objects and skilled personnel to be taken on the embassy. Were the objects purveyors of trade or tribute, or of 'useful knowledge' and 'industrial enlightenment'?

Introduction

The Macartney Embassy to China between 1792 and 1794 has an enduring legacy in the long history of encounters between Europe and China. The embassy is once more of historical interest as China rises to a key place in global markets of the twenty-first century. British trade missions to China, a regular occurrence since the mid-1990s, have stimulated renewed interest in this 'first embassy to China'. The recent emergence of a new research area in global history has also focused on problems of divergence in economic growth between East and West and especially between China and the West. Historians debate the extent to which the roots of such divergence were to be found in empire or in events and economic trends of the eighteenth century.[1] The first embassy, occurring as it did at the

1 E. L. Jones, *The European miracle: environments, economies and geopolitics in the history of Europe and Asia*, Cambridge: Cambridge University Press, 1981; Kenneth Pomeranz, *The great divergence: China, Europe and the making of the modern world economy*, Princeton: Princeton University Press, 2000.

end of the eighteenth century, was an event which revealed changing perceptions of China and the Chinese by different British interest groups from government, trade, industry and enlightened opinion.

Separate historiographies have produced different narratives of the embassy. The British goal of opening a permanent embassy in China after Macartney's meeting with the Qianlong Emperor failed, and interaction with China remained confined to trade mainly via the East India Company through Guangzhou (Canton). Historians of China have treated the embassy as a failure of understanding by the west of China's achievements, of her attitudes to the wider world, and of her own framework of diplomatic relations.[2] Economic historians have made frequent references to the embassy as a turning point when China failed to recognize the recent technological progress of the west, and turned her back on advances in science and technology.[3] Some have also written on the embassy as an event in the divergence between western and Chinese science, focusing especially on scientific and astronomical instruments.[4] But there is little on practical technologies and capital goods, nor on perceptions at the time of achievements in consumer goods production.

This article discusses the attitudes of British manufacturers and government policymakers towards their own new technologies and products as they confronted empire and China at the end of the eighteenth century. Sending an embassy to China entailed choosing suitable objects for gifts, tribute, display, and in the view of some, objects for future trade. The purpose of such gifts was to impress, to engage interest and curiosity, and to provide pleasure and thus to open personal friendship as a way to foster international connections. Although the events of the embassy have been frequently recounted, there has been less consideration of the objects taken on the embassy. A listing and valuation of these objects is in the papers on the embassy in the East India Company records.[5] There is also a small, but significant correspondence on the views of a major British industrialist, Matthew Boulton, and of Britain's foremost industrial lobbyist at the time, Samuel Garbett. These allow us access to the perceptions of industrialists and to the part they played in decisions on what objects and persons were taken on the embassy. This article will recount this correspondence, which can be found in the Matthew Boulton Papers, Birmingham Central

2 Joseph Needham and Wang Ling, *Science and civilisation in China: vol. 4, physics and physical technology*, part 2, Cambridge: Cambridge University Press, 1965, pp. 436–77; Mark Elvin, *The pattern of the Chinese past*, London: Eyre Methuen, 1973, pp. 179–99; James L. Hevia, 'The Macartney Embassy in the history of Sino-Western relations', in Robert Bickers, ed., *Ritual and diplomacy. The Macartney mission to China 1792–1794*, London: Wellsweep, 1993, pp. 57–79.

3 Jones, *The European miracle*, pp. 202–22; Joel Mokyr, *The lever of riches: technological creativity and economic progress*, Oxford: Oxford University Press, 1990, pp. 209–38; David Landes, 'East is east and west is west', in Maxine Berg and Kristine Bruland, eds., *Technological revolutions in Europe: historical perspectives*, Cheltenham: Edward Elgar, 1998, pp. 19–38.

4 For the most recent discussion see Simon Schaffer, 'L'inventaire de l'astronome. Le commerce d'instruments scientifiques au xviiie siècle (Angleterre-Chine-Pacifique)', *Annales: Histoire, Sciences Sociales*, 60, 4, juillet–août 2005, pp. 791–815. Another version of this article will be published as 'Instruments as cargo in the China trade', *History of Science*, 44, 2006, pp. 1–30. On Chinese responses to the embassy as set within wider frameworks of Chinese science, and especially astronomy, see Harriet Zurndorfer, 'Comment la science et la technologie se vendaient à la Chine au XVIIIe siècle. Essai d'analyse interne', *Études Chinoises*, 7, 1988, pp. 59–90.

5 British Library, India Office Records (henceforth BL, IOR), 'An account of sundry articles purchased by Francis Baring Esq., Chairman ... consigned to the care of ... Lord Viscount Macartney', Lord Macartney's Embassy to China. Miscellaneous Letters 1792–5, Factory Records China and Japan 1596–1840, G/12/92, pp. 545–86.

Library,[6] and it will analyse the listing and valuation of objects gathered by Boulton. It will argue that the projected embassy was an opportunity for an industrial and scientific exhibition, a showcase of Europe's and especially Britain's 'industrial enlightenment' as recently conceptualized by Joel Mokyr in his *The gifts of Athena*.[7] The failure of the Expedition was a failure in diplomacy, geopolitics and cultural understanding for its British participants. It was also, however, a failure to grasp the opportunity to display new British products and technologies as a part of enlightened scientific progress. The aims of the expedition and the goods taken on it instead depicted confused issues of empire, tribute, commerce and science. The gifts ultimately chosen for the embassy differed from those that would have conveyed Britain's distinctive advantages and prospects. Macartney's own views on what he was doing and what he saw, his correspondence with Britain's industrial leaders, notably Samuel Garbett and Matthew Boulton, and the descriptions and lists of items both considered for and eventually taken to China need to be added to the official accounts.

The article first sets out European perceptions of China's place in world trade in the seventeenth and eighteenth centuries, followed by a summary of the events of the Macartney Embassy. Aspects of the embassy will then be addressed in some depth: the embassy as a display of enlightened knowledge; the background of the embassy in trade and empire; and the preparations of the embassy, especially in gathering objects and people. The article will then investigate Matthew Boulton's role in the preparations, his perceptions of China, and the list of objects he compiled for the embassy. This list will be compared with the list of objects actually taken, and the article concludes with a discussion of British manufacturers' perceptions of potential markets in China, and how they could be developed.

The Macartney Embassy – background

Consciousness of China's commercial might and its impact on European society was not something new to the eighteenth century. The voyages of discovery of the sixteenth century and the East India Companies founded from the seventeenth century extended awareness of and access to the fabled empire only reached previously via the overland silk route. The voyages opened trade and a sense of a world economy. That world economy brought greater access to Asian consumer societies. Asian consumer goods – cottons, especially muslins and printed calicoes, silk, porcelain, ornamental brass and ironware, lacquer and paper goods – became imported luxuries in Europe.

By the later eighteenth century the British had experienced China through the large-scale importation and adaptation of luxury consumer goods. Products ranging from porcelain and silk to lacquer and cane ware furnishings and wallpaper radically transformed upper- and middle-class material culture. But it was tea drinking, and especially so after the

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The Catalogue of presents is reprinted in J. L.Cranmer-Byng, 'A case study in cultural collision: scientific apparatus in the Macartney Embassy to China, 1793', *Annals of Science*, 38, 1981, pp. 503–25, 520–3.

6 Birmingham Central Library, Matthew Boulton Papers, China Trade, Lord Macartney's Embassy, 1792, MS 3782/12/93 (henceforth BCL, MBP, Macartney's Embassy). On Matthew Boulton see H. W. Dickinson, *Matthew Boulton*, Cambridge: Cambridge University Press, 1937.

7 Joel Mokyr, *The gifts of Athena. Historical origins of the knowledge economy*, Princeton, NJ: Princeton University Press, 2002, pp. 9–15.

commutation of the tea tax in 1784, that placed China at the centre of the everyday lives of almost all in Britain. Tea made enormous demands on outflows of bullion to China. The British purchased £1,300,000 worth of tea in Canton in 1786, and paid out for nearly half of this in silver bullion rather than other export goods.[8]

By the late eighteenth century British manufacturers had created a new range of consumer products – textiles, earthenware, metal wares and machinery, paper goods, ornamental ware and novelties. They sold in diverse markets at home, in Europe and in the Americas. Policymakers and merchants now sought in China a potential market for a range of new and very different British goods.

Part of the attraction of the new British products was in the modernity of their response to the quantities and quality of Asian luxury products: by using different raw materials and sources of energy such as coal, as well as sophisticated systems of division of labour and mechanization, British manufacturers could substitute for Asian advantages. These were the new consumer goods with which Britain by the beginning of the 1790s could claim pre-eminence in Europe. They were fashionable, highly desirable and distinctively British. The advances of science and technology with which they were associated made them a part of the Enlightenment. Key figures of the Lunar Society, Matthew Boulton and Josiah Wedgwood understood their achievement in comparison with China, and seriously entertained the prospect of new markets for their products in the place that had originally inspired their inventions and new products.[9]

The Macartney Embassy provided a conduit for the ideas held by British statesmen, merchants and manufacturers on recent British advances in science, technology and consumer-goods production. Joel Mokyr, in *The gifts of Athena*, placed these advances at the heart of what he defined as the 'industrial Enlightenment'. Close connections between a scientific culture of 'open science' and scientific method on the one hand, and technological practice and artisan tacit knowledge on the other, yielded a distinctive 'useful knowledge'. This was a 'western useful knowledge' which underlay the origins of the Industrial Revolution, and provided another explanation for the divergence between Europe and Asia.[10] The Macartney Embassy, however, reveals less unity in enlightened, political and mercantile approaches to China. Ideas of scientific achievement were frequently at cross-purposes with the wider concept of 'useful knowledge'. The factors undermining the Macartney Embassy were certainly about misapprehension of cultural differences between East and West, and much has been written about these. But they were also about missing connections between scientific and technological cultures at home. Big differences in aspirations and practical

8 Holden Furber, *Rival empires of trade in the Orient, 1600–1800*, Minneapolis: University of Minnesota Press, 1976, pp. 131, 177, 175; Hoh-Cheung and Lorna H. Mui, *Shops and shopkeeping in eighteenth-century England*, London: Routledge, 1989, p. 250; Hoh-Cheung and Lorna H. Mui, 'Trends in eighteenth-century smuggling reconsidered', *Economic History Review*, 28, 1975, pp. 28–43, p. 42; Also see Hoh-Cheung and Lorna H. Mui, 'Smuggling and the British tea trade before 1784', *American Historical Review*, 74, 1968, pp. 44–73; David Mackay, *In the wake of Cook. Exploration, science and empire, 1780–1801*, London: Croom Helm, 1985, pp. 181–2.

9 See the case I have made for this invention of new British products in Maxine Berg, *Luxury and pleasure in eighteenth-century Britain*, Oxford: Oxford University Press, 2005. On Wedgwood's and Boulton's responses to Chinese products, see Robin Reilly, *Wedgwood*, 2 vols., London: Macmillan, 1989, vol. 1, pp. 87, 143; Rose Kerr and Nigel Wood, 'Ceramic technology', in *Science and civilization in China*, vol. 5: *Chemistry and chemical technology*, part 12, Cambridge: Cambridge University Press, 2004, pp. 740–72.

10 Mokyr, *The gifts of Athena*, pp. 28–77.

outcomes, in outlooks on the Chinese among British merchants and manufacturers, as well as among those on the embassy, and differences over the 'knowledge' those contributing to the embassy were trying to display to the Chinese were at least as important as diplomatic failures and cultural divide.

By the 1780s, Britain's trade with China was greater than that of all the other East India Companies combined. Most of this trade was organized through the East India Company, but there was also considerable private trade. The rapid expansion of the tea trade from the mid-eighteenth century, growing tensions in Guangdong with the rising numbers of ships and sailors, and increasing private trade conducted from India intensified dissatisfaction with Chinese restrictions on Western trade. The English tried on several occasions to trade at other ports further north, and to state their grievances over trade directly to the Court at Beijing.[11] Eventually, the British government sought a direct contact with the Chinese empire through an embassy. One was dispatched in 1787–8, under Charles Cathcart, MP, but was aborted after Cathcart died en route. By 1791 new plans were made for another attempt, and so started the famed first British embassy to China, the Macartney Embassy of 1792–4.

George Macartney was appointed Ambassador to China in 1792, and promoted to Viscount Macartney of Dervock in the Irish peerage. He had an impeccable background for such a delicate diplomatic mission with diplomatic and colonial experience in Russia, Grenada and India.[12] The total costs of the embassy were defrayed by the East India Company, but this was not to be seen as a mere commercial mission. Macartney was to carry a letter from George III to the Qianlong Emperor, and the object of the mission was stated to be to convey the King's congratulations to the emperor on the attainment of his eighty-third birthday. Macartney set out on 26 September 1792; his detailed instructions were only received on 8 September 1792, but extensive preparations had gone on long before this.

From the point of view of the East India Company this embassy was about freeing and enhancing conditions of trade in China for Britain. More optimistically, the embassy sought to increase imports into China from Great Britain and to 'excite at Peking a taste for many articles of English workmanship hitherto unknown there … [and] turn the balance of the China trade considerably in favour of Great Britain.[13] East India Company aspirations were not so very different from those expressed by the government in the years leading up to the embassy. The government, for instance, sought to implement longstanding plans to transfer the cultivation and manufacture of Chinese products to parts of the British Empire. Such projects started by The Society of Arts, Commerce and Manufactures in 1754, and continued with The Bengal Commercial Society in 1775, were also among the goals of the aborted Cathcart mission.[14] The government was also as interested as was the East India Company in using

11 Frederick Wakeman, 'The Canton trade and the opium war', in John K. Fairbank, ed., *The Cambridge history of China*, vol. 10, part 1, 1978, pp. 163–212, esp. pp. 163–78.

12 Louis Dermigny, *La Chine et l'Occident: Le commerce à Canton au XVIIIe siècle*, Paris: SEVPEN, 1964, vol. 3, pp. 1101–28, sets out the events leading up to the Macartney Embassy; H. B. Morse, *The chronicles of the East India Company trading to China 1635–1834*, Oxford: Oxford University Press, 1926, vol. 2, pp. 213–4.

13 Morse, *The chronicles*, vol. 2, p. 215.

14 P. J. Marshall, 'The Bengal Commercial Society of 1775: private British trade in the Warren Hastings period', *Bulletin of the Institute of Historical Research*, vol. 42, 1969, pp. 173–87; Mackay, *In the wake of Cook*, pp. 181–2.

the embassy to develop the fur trade to China. In the years leading up to the Macartney Embassy, there was much speculation over opening the fur trade between northwestern North America and China; there were a number of trading expeditions to the area, and eventually the Nootka crisis of 1790 which brought Britain and Spain to the brink of war.

Government interests leading to the Cathcart and subsequently the Macartney Embassy also had their own agendas. There were the increasing complications of dealing with different levels of monopoly in the Canton trade: the Chinese monopolists, the 'Cohong', the East India Company and the private trading firms in Calcutta in control of the 'Country trade' within East Asia. The Home Secretary Henry Dundas and the Board of Control wanted an embassy to facilitate more open access to China of wider British commerce, and not just that of the East India Company.

Perceptions of the China trade by a leading manufacturer like Matthew Boulton were shaped by the diplomatic and commercial information he could access. Some of this came through his friend, the Birmingham ironmaster and industrial lobbyist Samuel Garbett who was close to Dundas. The accepted authority on Britain's interests in Asia, Dundas was the most powerful figure in the government next to William Pitt, the Prime Minister.[15] This correspondence, in the hands of Matthew Boulton immediately prior to the embassy, addressed the prospects of much greater trade with China outside the limitations and monopolies imposed by the East India Company and the Hong merchants in Canton. While the letters expressed East India Company fears of Russian competition, both in the fur trade to China, and as Russia sought to gain a trading foothold in the Danish factory at Tranquebar on the south-east coast of India,[16] they also raised the advantages of a trade depot where Asian as well as European merchants could have free access. One of these letters claimed

> The immense coasting trade of China leaves no room to doubt, that our commodities wou'd spread thro' the whole of that great Empire, cou'd they be brought fairly to market … there can be no doubt, a people like the Chinese, greatly given to commerce, the transport of which is facilitated thro' the interior of the Empire by great magnificent canals and rivers in a climate which is very cold in winter wou'd willingly receive most articles of our woollen manufactures, cou'd they be adapted to the general convenience of the inhabitants.[17]

This and other correspondence indicated hopes of extending trade between Nootka and northern China, Korea, Japan and 'Liu Ch'iu', that is, Ryukyu. The fur trade, it was argued would provide an opening for 'the introduction of our goods, either direct or circuitously, to Corea, Japan, Liu Kiu, and all the other islands in their vicinity, most of which I can prove are already very commercial'.[18] The letters, written most likely by Captain Colnett who led a number of fur trading expeditions, including the one that precipitated the Nootka Crisis, and John Etches, a merchant also involved in the Nootka (now British Columbia)–China

15 Dermigny, *La Chine et l'Occident*, vol. 3, pp. 1118–19; Marshall, 'Britain and China in the late 18th Century', p. 20.

16 BCL, MBP, Macartney's Embassy, Letter (sender unidentified) to Samuel Garbett, 21 June 1792 Letters 10 and 11. Transcripts in an unidentified hand (also see letter, sender and recipient unidentified 12 June 1792).

17 *Ibid*. These points were expressed in the letters noted above (note 16) to Samuel Garbett, Letter 10, 12 June 1792.

18 *Ibid*. Letter 11 to Samuel Garbett [Birmingham], 21 June 1792.

trade were very similar to those written by Colnett and Etches to Joseph Banks seeking his support in extending the fur trade, and in promoting the prospects of Chinese markets.[19] Banks was at the time not only President of the Royal Society, but chief government advisor on natural history and expeditions, including preparations for the Macartney Embassy.

Facilitating and extending trade were key priorities of both the East India Company and the government. The East India Company instructed Macartney to cultivate the friendship of China in order to increase 'the sale of our manufactured articles and of the products of our territories in India'.[20] The prospect of new Chinese markets obviously attracted British manufacturers such as Matthew Boulton. There was also, however, a wider diplomatic purpose to the embassy, that is to try to exchange envoys with China, leaving behind the Secretary of the Mission or Vice-Envoy, Sir George Staunton, as resident minister.[21] The embassy conveyed the values of the Enlightenment, the search for human progress and knowledge and the extension of the arts and manufactures. Matthew Boulton also perceived his own encounter with China in this light. He saw himself not just as a manufacturer, but as a member of the Lunar Society, driven by his curiosity about the wider world as much as by his search for markets and profit.

The letter Macartney bore from George III claimed the encounter with the emperor and his realm arose from a common interest in 'extending the peaceful arts to the entire human race'. The letter set out the assumptions of an enlightened English king who 'directed his people to discover new regions of the globe', 'to extend knowledge of the world and to find the various productions of the earth' and to communicate 'the arts and comforts of life to those parts of the world where it appeared they had been wanting'. The letter also claimed the king's desire to know more about the 'arts and manners of Countries where civilization has been perfected', and to gain knowledge of 'those celebrated institutions' of China 'which have carried its prosperity to such a height as to be the admiration of all surrounding nations'.[22] Macartney himself wanted to convey to the Emperor and the Chinese authorities England's curiosity about the world and a desire to learn more about the morals and manners of other peoples. This was the enlightened endeavour of English gentlemen who distinguished themselves from the Canton traders encountered previously by the Chinese, and instead aspired to be men of taste, intellectual curiosity, disinterestedness and high moral principle.[23]

Preparations for the embassy: gathering skills and objects

The embassy was a huge undertaking. It consisted of 95 people directly connected with the embassy carried on the 64-gun HMS *Lion* and the EIC vessel *The Hindostan* and its tender

19 MacKay, *In the wake of Cook*, pp. 73–77.

20 'Instructions of the East India Company to Lord Macartney', reprinted in Morse, *The chronicles*, vol. 2, p. 233, cited in Dermigny, *La Chine et l'Occident*, p. 1121.

21 Tseng-Tsai Wang, 'The Macartney Mission: a bicentennial review', in Bickers, *Ritual and diplomacy*, pp. 43–56, p. 48.

22 James L. Hevia, *Cherishing men from afar: Qing guest ritual and the Macartney Embassy of 1793*, Durham, NC and London: Duke University Press, 1995, p. 61

23 *Ibid*., p. 67.

vessel, *The Jackal*. Presents valued at £2,486 taken over from the Cathcart Embassy, and a new assortment of presents valued at £15,610 were packed into 600 packages and later carried into Peking by 90 wagons, 40 barrows, 200 horses and 3,000 coolies. In addition there were trade goods and other presents bought in Batavia and Canton. The expedition was calculated to have cost the EIC £78,000, though the Chinese paid for all accommodation and travel expenses while in China, not just for the 95 attending the embassy, but for a further 600 who accompanied the embassy as back-up support to its landing place of Tianjin (Tiensin).[24]

Chief among the preparations was the gathering of presents and suitably skilled members of the embassy. This was undertaken with a background of assumptions over what would best attract the attention of the Chinese court. In some cases, these assumptions conveyed a newly sceptical view of Chinese exceptionalism. Those on the voyage were confident of British technological progress and commercial institutions. Macartney himself wrote in his pocket book for the journey, that the English were 'at this moment the first people of the world whenever they are out of their own country ... Their generosity, the child of opulence and industry, is unbounded.'[25] Joseph Banks, whose advice framed the embassy, now placed British technology on a higher level than Chinese achievement. He believed that China now had only 'the ruins of a state of civilization', but thought the useful and ornamental branches of science would gain from the mission. It was important, therefore, that Macartney take some technically trained members on the embassy. He commented that while the Chinese had long known all the great inventions which now characterized British civilization, yet 'a few practical men admitted among them would in a few years acquire a mass of information for which if placed in the industrious and active hands of English manufacturers the whole revenue of the Chinese empire would not be thought sufficient equivalent.'[26]

To accomplish the technological goals of the embassy, and to assemble and repair the British technological displays, Macartney gathered a notably cosmopolitan entourage of 'useful knowledge' from all over Europe. He first sent to Naples via Sir William Hamilton and recruited from the Chinese mission college two native Chinese who could translate between Chinese and Latin or Italian, and who would advise on Chinese culture.[27] The Scottish natural philosophy lecturer James Dinwiddie and the Swiss clockmaker Charles Petitpierre were also recruited to assemble and orchestrate a demonstration of the scientific instruments, especially the great planetarium. A mathematical instrument maker, Victor Thibault, a metallurgist, Henry Eades, and a botanist, David Stronach, were recruited. Along with these were five German musicians and their leader, as well as an unspecified number of artisans, the painter and draughtsman Thomas Hickey, and the painter William

24 Wang, 'The Macartney mission', pp.46–7; J. L. Cranmer-Byng, *An embassy to China. Being the journal kept by Lord Macartney during his embassy to the Emperor Ch'ien -Lung 1793–1794*, London: Longmans, 1962, pp. 35, 338.

25 Marshall, 'Britain and China in the late 18th century', in Bickers, *Ritual and diplomacy*, pp. 11–30, pp. 14–16; cf. Dermigny, *La Chine et l'Occident*, p. 1121.

26 Cited in Marshall, *ibid.*, pp. 24–5.

27 Sir George Staunton, *An authentic account of an embassy from the King of Great Britain to the Emperor of China*, Dublin, 1798, p. 32.

Alexander.[28] Hickey and Alexander were to provide far more than a graphic account of the embassy. Their topographies of China conveyed landscapes, everyday life, dress and arts to a generation of Europeans afterwards. Apart from those trained in the sciences and the polite arts, Macartney needed practical artisans. Joseph Banks wrote to Thomas Percival, a Manchester physician, in February 1792 that Lord Macartney wanted to take skilled persons in various trades to China. Banks suggested that a Master of the Manchester Board of Dyers should go.[29]

It is particularly notable that Macartney consulted Matthew Boulton in his search for skilled artisans. Advised by Dundas and Garbett, he turned to Boulton for 'an operative tradesman, skilled in metallurgy, who would tend to improve our own & to discover the taste of the people'. Boulton went to great efforts to oblige, eventually suggesting his own twenty-four-year-old mercantile assistant, Zaccheus Walker, who though not an artisan had been brought up in, and had a wide knowledge of, the Birmingham trades.[30] In the event, Macartney did not take anyone from Birmingham – 'I embraced other offers made to me, and am already provided.'[31]

The artisans and craftsmen taken on the voyage were to assemble the equipment and to set up the displays once in China, but we know nothing of who or how many they were. Though Macartney described himself as 'provided' with such skilled artisans as he needed, he also complained of key absences just as he was ready to depart. He had been unable to recruit anyone with a good knowledge of silk and cotton, nor of porcelain and earthenware: he accused manufacturers of fears of sending their tradesmen who might convey the secrets of their own technologies to the Chinese.[32]

> With regards to the Chinese manufactures of silk and cotton I was from the beginning so well aware of the importance of obtaining the most accurate information that might tend to any improvement of the manufactures of our own country, or of those dependent upon us abroad, that I proposed to take with me persons practically conversant in the manufactures who might possess a more nice and quick discernment of any variation, either in the material or the working than men only possessed of general knowledge.[33]

Sir George Staunton conveyed what he speculated to be the curiosity and new cultural engagement of the group of artisans on their departure:

> They had just quitted their former stations, oldest habits, and most close connections, to engage in a hazardous, but interesting, enterprize. They are not Argonauts, indeed,

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28 Cranmer-Byng, *An embassy to China*, p. 24; Schaffer, 'L'inventaire de l'astronome ', pp. 791–2.

29 In Warren R. Dawson, *The Banks letters. A calendar of the manuscript correspondence*, London: Trustees of the British Museum, 1958, p. 665 (from Catalogue of Messrs. F. J. and A. E. Dobell, 15.49).

30 BCL, MBP, Macartney's Embassy, Matthew Boulton to Lord Macartney, 25 July 1792.

31 BCL, MBP, Macartney's Embassy, Letter from Macartney to Boulton, 9 March 1792 and 30 July 1792.

32 BL, IOR, Letter from Macartney to the Chair & Deputy at Canton, Canton 23 December 1793, Factory Records. China and Japan, G/12/92, p. 386.

33 BL, IOR, Lord Macartney to Francis Baring and John Smith Burgess, Chairman and Deputy Chairman, Portsmouth, 13 September 1792, Factory Records. China and Japan. G/12/92. Letters from Lord Macartney, 13 September 1792–13 February 1795; also Lord Macartney to Chair and Deputy at Canton, Canton, 23 December 1792. Factory Records. China and Japan. G/12/92, p. 376.

> actuated by the hope of obtaining a golden fleece; but, impelled by the strong incentive of curiosity, and eager to indulge the spirit of inquiry . . .[34]

Macartney and others preparing the embassy believed there had to be skilled technicians aboard to assemble and care for the instruments they were bringing to the Chinese. They argued these skills were unique, and this became an issue of contention with the Chinese officials once they arrived. The embassy made claims to the Chinese about the delicacy of the instruments, the length of time it would take to assemble them and the need for their own skilled craftsmen to get them working properly. The Chinese, however, believed that their own technical expertise was more than adequate. An edict was sent out by the Grand Council to gather 'the most skilful Western Ocean men from the Halls [churches of the missionaries in Peking] who are versed in astronomy and capable of repairing clocks, and bring them to Jehol' [Rehe] (modern Chengde) at the summer palace.[35] Most of the presents were, however, displayed in Yuanmingyuan, a suburb of Peking, under the supervision of other western missionary and Chinese craftsmen.

The next problem was the goods that were to be taken on the embassy. William Pitt and Henry Dundas contended that the Emperor should be presented with a select and impressive show of textiles and trade goods which would include astronomical models, reflecting telescopes, electrical machines and air pumps.[36] There was a widespread assumption that astronomy was peculiarly esteemed in China, so that the latest astronomical instruments were especially important.[37] Other goods were to be 'specimens of the best British manufactures and all the late inventions for adding to the conveniences and comforts of social life' to serve the 'double purpose of gratifying those to whom they were to be presented, and of exciting a more general demand for the purchase of similar articles'.[38]

The Chinese recruits offered their advice. They pointed out the great demand in Canton for automata, or 'sing-songs', as they were known there, 'extraordinary pieces of ingenious and complicated mechanism, set in frames of precious metal, studded with jewels and producing by means of internal springs and wheels movements apparently spontaneous'. It was hoped that 'the momentary gratification produced by those gaudy trifles, had been satiated by the accumulation of them', and that 'whatever tended to illustrate science, or promote the arts, would give more solid and permanent satisfaction to a prince whose time of life would, naturally lead him to seek, in every object, the utility of which it was susceptible'.[39]

Despite these aspirations to send goods of the highest quality, made in Britain by the most modern manufacturing methods, and the stated laudable claims that it was these that would most impress the Chinese emperor, the goods sought out were not of this type at all. Indeed Macartney and others with him believed that Asian courts would only be impressed by elaborate display, spectacle and pomp. They therefore sent two coaches

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34 Staunton, *An authentic account*, p. 39.

35 On the role of the Jesuit missionaries in Peking with scientific and technical skills and the part they played during the embassy see Cranmer-Byng, *An embassy to China*, p. 150.

36 Schaffer, 'L'inventaire de l'astronome', p. 800.

37 Zurndorfer, 'Comment la science', pp. 67–72.

38 Staunton, *An authentic account*, p. 34.

39 *Ibid*., p. 33.

decorated in imperial yellow, and an elaborate planetarium ostentatiously embellished in gilt, enamel and chinoiserie decoration including pineapples, all the decoration carried out by London's leading luxury toy and clockmaker, Vulliamy.[40] The centrepiece of the Emperor's gifts was in fact this large planetarium, the Hahn Weltmaschine, made not in Britain, but in Germany and bought for £600; Vulliamy was paid another £650 to embellish it. Macartney was advised in Macao, where the English toy dealer James Cox kept an outlet, to add more automata to what he was carrying, that the Emperor had a special fondness for such toys.[41] And while there he bought more astronomical instruments – a telescope, a Herschel reflector, another orrery, and other gifts from the trade goods brought by the captain of the *Lion*, Mackintosh, 'two watches of very fine workmanship' and 'Parker's Great Lens', which was 12–16 inches in diameter.[42] What happened to cause this huge discrepancy between the goals over what goods should be taken, and what actually went?

British manufactures and the Macartney Embassy

Matthew Boulton provided another perspective on the types of goods that should be taken on the embassy. Approached by the East India Company and subsequently by the Lords of the Committee of Council on the embassy, Boulton initially chose his own products and patterns. He also offered his opinion on what would best represent British industry:

> I conceive the present occasion to be the most favourable that ever occurred for the introduction of our manufactures into the most extensive market in the world and the only means of accomplishing that object is to send a very extensive selection of specimens of all the articles we make both for ornament and use. I don't mean as presents to great men but such as are vendable through all the middle and lower class of people.[43]

Boulton emphasized the utility, price and variety of the goods he chose. 'I hope those [presents] will not be forgot that are strikingly and evidently useful and of small price; such will naturally be knives of all sorts, small buttons which are worn on their dress and at their sleeves, and perhaps small light padlocks suited for their boxes and other cheap locks of different sizes.'[44]

Samuel Garbett acted as an intermediary between Boulton, the government and Macartney.[45] He conveyed Boulton's views to Macartney, and wrote back to Boulton about

40 Hevia, *Cherishing men*, p. 79.

41 Schaffer, 'L'inventaire de l'astronome', p. 799. A number of the automata in the imperial collection were supplied by Cox's Museum, the London toymaker and by the branch of the firm set up by Cox's son in Macau. See Marcia Pointon, 'Dealer in magic: James Cox's jewelry museum and the economics of luxurious spectacle in late-eighteenth-century London', *History of Political Economy*, Supplement, 31, 1999, pp. 423–51.

42 Hevia, *Cherishing men*, p. 104; Schaffer, 'Inventaire de l'astronome', pp. 803–4.

43 BCL, MBP, Macartney's Embassy, Matthew Boulton to James Cobb, East India House, nd 1792, letter 19.

44 *Ibid.*

45 On Samuel Garbett see P. W. Bebbington, 'Samuel Garbett 1717–1803', Birmingham University MComm Thesis, 1938, Birmingham University Library, p. 100. On Boulton's friendship with Garbett (1715–1803) see Dickinson, *Matthew Boulton*, p. 39.

discussions on plans for introducing British goods into China. This correspondence between Garbett and Boulton in the months just before the expedition provided close detail not just on the objects to be sent as samples, but on how they would be traded.

> I urged as a matter of great consequence that some persons (from this and other places) who were well acquainted with our manufactures and modes of working might have permission to travel into the different wealthy provinces of China in order to shew their patterns to merchants and shopkeepers, not only to promote an extensive sale of our *present* wares by gaining commissions to send *certain* quantities on *certain* terms, but ... to devise means of adopting our modes of working to other fabricks or toys that would be more agreeable to Chinese fashions and taste.[46]

Boulton and Garbett both emphasized learning about the Chinese, adapting to their tastes, indeed thinking about Chinese consumers. Boulton was curious about the Chinese, their customs, dress and material culture, with a view to adapting products to appeal to these. He wrote to Garbett, expressing his ignorance, but nevertheless speculating about what he could provide for women's dress.

> Our knowledge of China is so imperfect that it will be difficult to point out the most necessary articles to send thither. The women are kept so confined that we know nothing of them but from pictures, which I believe are faithful representations of their dress. It must be from those we can suit the taste of the Chinese fair sex, who, I conclude, study their own elegance and finery as well as those of other countries; rings and perhaps laces for their linen might be presents for them.[47]

Boulton's and Garbett's optimism on the prospects of Chinese markets for British goods, as we have seen, was clearly informed by the descriptions and speculations in the commercial correspondence on the fur trade and China in their possession. One document in their possession commented on the opportunities for English woollens, and along with these, other goods in Northern China as the fur trade grew.[48] The writer of a 'Letter about the state of the China trade' was very critical of the British factory at Canton: the East India Company officials there were prejudiced and ignorant. 'Our Factory at Canton knows no more of the Chinese character than they do that of the Cham of Tartary. They have imbibed prejudices they do not seek to enquire into; they are not known three streets from their houses; have never enquired into Chinese history, language or manners.'[49] He reported travelling through the Moluccas where he found many Chinese trading through Batavia for tea, china, rice and paper in return for wax, woods and gold dust. 'It certainly would not be difficult to introduce several articles of our manufactory amongst the innumerable inhabitants of these seas such as knives, razors, hatchets, saws, iron pots, tin ware, pins, needles, thread, arms powered shot etc.'

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46 BCL, MBP, Macartney's Embassy, Samuel Garbett to Matthew Boulton, 13 July 1792, Letter 14.

47 BCL, MBP, Macartney's Embassy, [Boulton] to Samuel Garbett[Birmingham], 8 July 1792, Letter 13.

48 BCL, MBP, Macartney's Embassy [Sender unidentified] to Samuel Garbett [Birmingham], 21 June 1792.

49 BCL, MBP, Macartney's Embassy [Sender and recipient unidentified, transcription in Samuel Garbett's hand], Letter about the State of the China Trade, Written at Sea, 9 April [no year].

Boulton, who always saw himself as 'manufacturer to all the world' found another opportunity for eloquent endorsement of his products. 'I fear that too often fine things only have been thought essential, to give splendour to our manufactures, but as those things must always be confined amongst a few, the intention defeats itself. Things adapted to general use, that are within the reach of the many, is the thing sought for.'[50]

The gifts

With the embassy landing at Tianjin at the end of July 1793, came the problems of offloading the gifts and providing a list of the gifts. Most of the history of western views of China since the eighteenth century has been based on Chinese responses to the gifts brought by the embassy. Controversies continue over British failures of cultural understanding of Chinese court rituals of 'kowtow' before the Emperor, and over Macartney's refusal to do this, substituting instead bowing on one knee as he did before his own sovereign. The 'kowtow', the ritual of kneeling and touching the head nine times to the ground on entering into the presence of the Emperor, was indicative in David Landes' view not just of the Chinese belief that the Emperor was the 'son of Heaven', but of the Chinese sense of 'moral, spiritual, and intellectual superiority' over the rest of the world.[51] Worse than this, however, was China's repudiation of Western science and technology, indicated by the response of the Chinese to the gifts of the Macartney Embassy: 'we have never valued ingenious articles, nor do we have the slightest need of your Country's manufactures. Now England is paying homage … Though their tribute is commonplace, my heart approves sincerely. Curios and the boasted ingenuity of their devices I prize not.'[52]

These words were quoted time and again from this period to indicate the huge cultural gulf between Europe and China, to indicate China's repudiation not just of Western trade and technology, but of the whole enlightenment project. James Hevia has given careful reconsideration to the interpretation of the imperial edict within the context of the listing, handling, transport, and assembly of the English gifts. He explains the edict in terms of Chinese court protocol over tribute, and the different meanings that the British and the Chinese perceived in the goods and how they were presented. Macartney wished to invest the gifts he brought on the embassy with meanings beyond those of mere trade goods. He wanted to distinguish between the gifts sent by the Crown and the goods the EIC wished to trade in China. He therefore stressed the scientific virtue of the goods. He had differences with Captain Mackintosh, the EIC captain of the *Hindostan*, over what goods would go to Peking.[53] He noted on 1 August, 'Captain Mackintosh not satisfied with my refusal of taking his furs … Now he wants to send trade to Pekin … Captain Mackintosh … may come to Pekin if he pleases but merely from curiosity and not from trade.'[54]

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50 BCL, MBP, Macartney's Embassy, [Boulton] to Samuel Garbett [Birmingham], 8 July 1792.

51 David Landes, *The wealth and poverty of nations*, London: Little, Brown and Company, 1998, pp. 335–49.

52 Cranmer-Byng, 'Lord Macartney's Embassy', pp. 136–7. For the full edict see Cranmer-Byng, *An embassy to China*, pp. 347–41.

53 Hevia, *Cherishing men*, pp. 73–8.

54 Cranmer-Byng, *An embassy to China*, pp. 44–5.

Macartney wanted to convey that the gifts he brought from the Crown and his own presents were both the most precious considered in Britain, and the best examples of British science and technology, and that they were, therefore, superior to the clocks, automata and astronomical instruments brought by earlier visitors. He wrote to Dundas,

> Those gifts we had to offer would suffer by being confounded with mere curiosities, which however expensive or even ingenious were more glittering than useful … a List was delivered to the Mandarins … in which the nature of the several articles was attempted to be described, measuring their Merit by their utility and deriving even a credit from the omission of splendid trifles.[55]

The Chinese, even before the ships had anchored at Tianjin, were very concerned over what they perceived as the tribute gifts; they demanded a list as soon as possible.[56] Much was invested in the Catalogue and in explanations of the gifts. The preamble to the Catalogue stressed that between Sovereigns the intent, rather than the gifts themselves was of greater value. Detailed descriptions were provided of each item with superlatives of their wondrous attributes and their uniqueness. But, as we have seen, most of these were not the newest and best of British manufacture as seen, for example by her leading manufacturer, Matthew Boulton, but one-off luxuries such as Vulliamy clocks, mechanisms for spectacular displays, and above all a German-made planetarium. The result was that the embassy showed that Britain could produce luxury goods, but so too could other European and Asian courts.

Why did the British centre their display of the best and most precious of British objects around automata and theatrical scientific instruments? Was this because these items were considered to be high luxuries in Britain, things valued by aristocrats and monarchs, and considered to be enlightened objects of consumption? Or was it because of views taken of China at the very outset of the embassy as a despotic state, ruled by an ageing Emperor and corrupt officials more interested in performing toys and playthings than in enlightened advances in science and technology? James Gillray caught the assumptions of those who devised the embassy in the caricature he drew of the embassy three days after Macartney set out from London. 'The Reception of the Diplomatique and his Suite, at the Court of Pekin' depicted the gifts as playful gadgets in the form of cricket bats, rocking horses, beehives and birdcages.[57]

The embassy's rather disorganized and even cavalier method in going about collecting other types of British manufacture shows little of the aspirations conveyed in the letter of George III for transmitting the 'arts and comforts of life' to other parts of the world. Matthew Boulton's goals of sending an 'extensive selection' of articles 'both for ornament and use', not as 'presents to great men, but such as are vendable through all the middle and lower class of people' were not seriously entertained. He wanted to send patterns for the finer branches of Birmingham goods as well as a collection of the kind of ironmongery exported to America. He provided an extensive list of the best of the new

55 Macartney to Dundas, 9 November 1793, cited in Schaffer, 'L'inventaire de l'astronome', p. 801.

56 Cranmer-Byng, 'Lord Macartney's Embassy', pp. 131–2.

57 Simon Schaffer draws attention to the caricature, noting that the image was neither inaccurate nor anachronistic. Schaffer, 'L'inventaire de l'astronome', p. 807.

Birmingham and Sheffield ware: buttons, buckles, plated wares, coins made by the new coining machinery, steel ware, steel and brassware, japanned and enamelled wares with accounts of the techniques, watchmakers' tools and surgeons' instruments, lamps including the new Argand lamp, cutlery, razors and scissors, candlesticks and snuffers and a variety of hand mills, jewellery, toys and other small metal goods.[58] He placed a special order for a set of fine steel sword blades, 'being persuaded the Chinese are strangers to the excellence of such steel & such tempering'. 'I am of opinion they are better blades than ever was made in this or any other country.'[59] These were all products of the new modern manufacture much admired in Europe and America. The list of Birmingham's best that Boulton sent to Macartney was compiled in *A general list of goods manufactured at Birmingham and its neighbourhood*.[60] It included fifty-three types of goods, described in some detail, and ranging from buttons and buckles to steel, plated and enamelled wares, from candlesticks and stained glass to scissors, patent lamps and watchmakers' tools.

These were the unique objects that the embassy might have shown the Emperor and the Chinese court, along with the machines that made them. Macartney visited the steam engines pointed out to him by James Watt, but he decided against taking one: 'having conversed with several intelligent persons who have been in China & having considered the size of the Machine, the difficulty of showing it & other circumstances attending it, the idea of carrying one aboard with us is now given up & some other articles are to be substituted in its place'.[61] A model of a steam engine was in the Macartney Catalogue, but there is no indication that it was demonstrated.[62] A German planetarium embellished by a luxury London jeweller and clockmaker, despite its cost and the subsequent difficulties of its packaging, assembly and display, was considered crucial for the embassy; a steam engine was not.

Nor were Boulton's other goods, more amenable to the journey, received by Macartney with the enthusiasm he expected. His energy in acting as an agent of the Government and ordering patterns for the best of the goods produced in the region did perhaps go a little too far: 'the more I think of this object the more my ideas swell as to the magnitude of the patterns [samples] in question & instead of sending £1,000 worth as I recommended in my last I now think if it was my own private concern I should send from £4–6,000 worth.'[63] He dramatically reduced the collection and countermanded many of his orders after a letter from Macartney advising him, 'nothing more than mere specimens were intended to be sent to Pekin upon the present occasion, and for which the allotted sum of £150 was deemed sufficient, as no very costly or heavy articles were to be included'.

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58 BCL, MBP, Macartney's Embassy, Matthew Boulton to James Cobb, Letter 19.

59 BCL, MBP, Macartney's Embassy, Matthew Boulton to James Cobb, 3 August 1792.

60 BCL, MBP, Macartney's Embassy, 'A General List of Goods Manufactured at Birmingham and its Neighbourhood' C. 22 July 1792. A copy of the list was enclosed in Boulton's letter to Robert Wissett, Secretary to the East India Company, 22 July 1792.

61 BCL, MBP, Macartney to Boulton, 9 March 1792.

62 Dinwiddie afterwards gave scientific lectures in Canton, but there is no indication whether he demonstrated the model engine. He did do so in India after the expedition when he travelled to Calcutta with some varieties of tea plants for the East India Company's botanic garden. BL, IOR, Lord Macartney to the Chair & Deputy at Canton, Canton, 23 December 1793, Factory Records. China and Japan. G/12/92, p. 381; William Jardine Proudfoot, *Biographical memoir of James Dinwiddie*, Liverpool, 1868.

63 BCL, MBP, Macartney Expedition, Boulton to Cobb, Letter 19, undated.

Macartney added that he had extended the sum to £300–400, and added 'you may be assured that I shall do my utmost to distribute everything sent by me for the benefit of the Manufacture so as to excite and encourage the taste and demand for such goods throughout the country and among the several classes of people in China'.[64]

Boulton complained bitterly to James Cobb at East India House about the chaotic procedure in gathering the goods, and his rough treatment by the East India Company and the embassy. He had received the order from the Lords of the Committee of Council to make the collection of patterns for the embassy, but had no subsequent communication from them. He discovered that a separate approach had been made to another manufacturer, Messrs Smiths, and that another person had been buying up samples in Birmingham for the embassy. He was then told that if the value of the Birmingham patterns sent came to more than £400, all would have to be returned. Boulton regarded himself as the key agent of the best of British industry, and had the remit, he had thought, of supplying a representative assemblage of this to the embassy. By now completely disenchanted with the whole enterprise, he had his goods repackaged in London to meet a limit of £300, and left his invoice.[65]

We know little about the goods or how they were received. Most historians have focused on the planetarium and the clocks.[66] The detailed inventory[67] of the goods purchased for the embassy by Francis Baring and John Smith Burges, chairman and deputy chairman respectively of the East India Company, left with the embassy's records, indicates that such historical attention is perhaps not misplaced, for by far the greatest proportion of the valuation of the £13,123 12s 4d spent on articles of presentation for the embassy (excluding the £2,486 worth of goods also taken from the aborted Cathcart Embassy of 1787) was made up of mathematical, philosophical and scientific instruments, including the £1,262 19s spent on the planetarium.

There were, however, other consumer and industrial goods to indicate perceptions at the time of priorities placed on the goods, both as gifts and as potential commodities for a Chinese market. The package of specimens of manufactures was an assortment put together from a few places and by a few individuals. Textile samples were gathered by the Chamber of Commerce in Leeds, but in other places by individual manufacturers: Kellie and Burt from Bradford; John Couch from Exeter; Harvey and Co. from Norwich; Sheppard & Hicks from Gloucestershire; J. Anslie from Wiltshire; Brown, Sharp and Co. from Paisley and John Lodge from Lancashire. Harris and Son and well as Cliff and Pratt provided the Coventry specimens. Birmingham specimens were provided not by Matthew Boulton, but by William and Richard Smith, though the package of manufactures did include a set of Boulton's pieces.[68]

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64 BCL, MBP, Macartney Expedition Macartney to Boulton, 9 March 1792.

65 BCL, MBP, Macartney Expedition. Boulton to James Cobb, 8 August 1792.

66 See Zurndorfer, 'Comment la science', pp. 78–9; Schaffer, 'Instruments as cargo'.

67 BL, IOR, Factory Records China and Japan 1596–1840, G/12/92. An account of sundry articles purchased by Francis Baring Esq., Chairman … consigned to the care of … Lord Viscount Macartney, Lord Macartney's Embassy to China. Miscellaneous Letters 1792–95, pp. 545–86.

68 *Ibid.*, p. 578.

The list cannot, however, be credited with conveying Britain's 'useful' and enlightened knowledge. The category of mathematical, scientific and philosophical instruments, to be sure, contained numbers of microscopes, telescopes, thermometers, barometers, a chronometer, apothecaries' scales, a set of diamond scales, an air pump, a gold watch and various astronomical instruments. But their descriptions give as much detail to the mahogany, japanned and glass casings and their ornamentation as they do to the instruments. One category of chemical, electrical and philosophic apparatus did contain items more immediately relevant to manufacturing technology: chemical apparatus; bottles and stoppers for acids; vitreous acids and sulphuric acid; magnets and magnetic apparatus; portable furnaces; a foundry; fire works; electrical machines and engines; a portable steam engine; a model of a lock; a printing press and various mathematical and optical tools.[69] Here were items which indicated the 'shared technical vocabulary' between British natural philosophers, engineers and entrepreneurs discussed by Margaret Jacob, Larry Stewart and Joel Mokyr.[70] But for the most part, the list separated out luxury (including scientific luxury) goods from wider consumer and industrial products.

British perceptions of Chinese responses

Apart from this listing of goods, there was little to indicate the extent to which those conveying this huge assemblage of things to the other side of the world, saw themselves as conducting an industrial exhibition.[71] Sir George Staunton, the Vice Envoy, hoped for a positive reception when he noticed that that 'several of the courtiers were partly dressed in English cloth, instead of silks or furs, in which only it had hitherto been allowed to appear before his Imperial Majesty'.[72] He took this as a compliment to the British embassy. Nor was there a great deal recorded of the reactions of those few Chinese, apart from the emperor, allowed access to the displays. There are occasional indications in some of the journals of the voyage. Macartney wrote in his notes of reactions when some of the specimens were first opened in September. The Chinese officials who attended expressed 'admiration' and were 'much excited' by the gifts and 'specimens of different Manufactures' as well as by 'little articles of use and convenience which Europeans are accustomed to'. There was special interest in Birmingham sword blades and fine clothes, as well as musical instruments. Indeed they had drawings made of the instruments so that they could

69 *Ibid.*, pp. 545–86.

70 Margaret Jacob, *Scientific culture and the making of the industrial west*, Oxford: Oxford University Press, 1997, pp. 106, 115; Larry Stewart, 'A meaning for machines: modernity, utility, and the eighteenth-century British public', *Journal of Modern History*, 70, 1998, pp. 259–94; Mokyr, *The gifts of Athena*, pp. 38–42, 54–6.

71 On early industrial exhibitions see Toshio Kusamitsu, 'Great exhibitions before 1851', *History Workshop Journal*, 9, 1980, pp. 70–89. These first provincial exhibitions started in 1837. Much more specialized and temporary exhibitions were common from the mid-eighteenth century. Robert Anderson, 'Workers and collections', unpublished paper for 'History of Science' seminar, Oxford, 18 May 2004.

72 Cited in Alain Peyrefitte, *The collision of two civilisations: The British expedition to China in 1792–4*, translated by Jon Rothschild, London: Harvill, 1993, p. 221.

be reproduced in China. Thus, Macartney's comment 'not withstanding their vanity and conceit, they are not above being taught'.[73]

Aeneas Anderson, Macartney's personal servant during the embassy, recounted the unpacking of some of the presents, consisting of 'plated goods, hardware and cutlery', and the 'Whole was divided between the Emperor and the Grand Choulaa'.[74] Macartney himself only mentioned lustres, globes, the orrery, Vulliamy's clocks, figures and vases as these were put up in the Palace of Yuanmingyuan at the end of August 1793. He observed the admiration of the Emperor for the model war ship with its canons, 'The Royal Sovereign', valued at only £142, and of the Emperor's grandsons for the Derbyshire porcelain vases; they asked him to compare Chinese and Derbyshire porcelain. Macartney replied that the British porcelain was 'considered to be very precious of its kind', but that Chinese porcelain was also greatly valued in Britain for so much of it was imported.[75] There was no mention of the six vases sent by Wedgwood who was more than pleased to be sending his ceramics to China. Macartney perceived the Chinese response to the objects as 'tribute' when taken on a tour of the pavilions which

> are all furnished in the richest manner, with pictures of the Emperor's huntings and progresses; with stupendous vases of jasper and agate; with the finest porcelain and japan, and with every kind of European toys and sing-songs ... and in such profusion, that our presents must shrink from the comparison and 'hide their diminished heads'.[76]

Macartney's Embassy failed. His hopes of staying in Peking much beyond the month allotted came to nought, and the Chinese hurried him out of the capital and on an overland route back to Canton. He left another letter for the Emperor again requesting more ports where the English could trade with China, a permanent warehouse in Peking and lower duties on the trade in Canton. He gained none of these, but the British still did not give up, and in 1795 sent letters and ten cases of presents from the king to the emperor via an East Indiaman going this time to Canton.[77]

Conclusion

What does this hugely costly expedition tell us about enhancing and transferring 'useful knowledge'? It could be argued that this is not what the embassy was about at all: tribute and presents serve a purpose different from those of displays of new science and technology, industrial exhibits and trade fairs. The British had long been well immersed in the protocols of Asian tribute ceremonies, not just in China, but also in India.[78] Nevertheless there was

73 Hevia, *Cherishing men*, p. 103.

74 Aeneas Anderson, *An accurate account of Lord Macartney's embassy to China: carefully abridged from the original work with alterations and corrections by the editor who was also an attendant on the embassy*, London: Vernor and Hood, 1797, p. 95.

75 Cranmer-Byng, *An embassy to China*, p. 99.

76 Cited in Hevia, *Cherishing men*, p. 179.

77 Morse, *The chronicles*, vol. 2, p. 225; Cranmer-Byng, 'Lord Macartney's Embassy', p. 180.

78 Natacha Eaton, 'Between mimesis and alterity: art, gift and diplomacy in colonial India, 1770–1800', *Comparative Studies in Society and History*, 47, 2004, pp. 816–44.

enough in the directives of the embassy, the rhetoric of government ministers and in the assemblage of the goods themselves to indicate that this embassy was to convey a set of goods and displays to China distinctive from those that had been carried before. Most connected with the embassy saw themselves as bearers of 'enlightened values' and the goods they brought as indicative of recent scientific and technological progress in Europe. The links espoused, however, between science and the arts were not carried out either in the personnel on the voyage, or in the selection of goods taken.

Macartney, himself, reflecting afterwards on the embassy while he was in Canton, wrote an extensive report on what he firmly believed to be serious prospects in Chinese markets. He also set out descriptions of Chinese manufactures and technology. On consumer markets he wrote,

> Already worthless cloth and watches seem to be indispensable necessaries to every Gentleman at Pekin, and even to his principal attendants. Markets for woollens and stockings could easily be developed ... Besides such woollens as have hitherto been sent thither, I conceive that no inconsiderable quantity of what is called fleecy hosiery would find a vent in the Northern Provinces.

These would substitute for furs, and were cheaper.[79]

He also entertained real possibilities for other textiles: Irish tabinetts and other linens, and fine Manchester cottons 'for the women, for whom the men here seem at all times anxious to procure ornaments of every kind; especially earrings and necklaces of different coloured stones or of glass, or gold, or gilt'. He thought European paper and glass would succeed, as would 'a vast variety of our hardware'. And he acutely and presciently observed 'when the number of Consumers in so vast and populous an Empire as China is considered there are few articles so low priced when singly taken, as collectively to be insignificant, and when demanded by millions they rise to be of value, and cease to be below the notice even of a great commercial Company'.[80]

Indeed Macartney, when turning from the indifference of the Mandarins to the embassy's scientific and technological novelties on display in Rehe, and speaking of more ordinary people was at least as optimistic about their consumerism as was Matthew Boulton. He corrected some of his earlier preconceptions on the relative backwardness of the Chinese, writing that 'in general I have found no people more curious, more greedy after novelty, or more eager to increase their personal convenience than the subjects of this Country. They soon perceive the preference due to the new objects presented to them before whatever had hitherto supplied its place among themselves.'[81]

Macartney admired the division of labour practised in China's large-scale manufactures which, combined with their low wages, gave their goods advantages in international markets, but criticized her lower-level copper and tin manufacture. He provided detailed accounts of cotton plantations, production and its rising consumption in China.[82] He had

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79 BL, IOR, Factory Records, China and Japan, G/12/92, Macartney to the Chair & Deputy at Canton, India Office Correspondence, p. 375.

80 *Ibid.*

81 *Ibid.*, pp. 376–7.

82 *Ibid.*, p. 386.

the Viceroy collect specimens of porcelain to send to Joseph Banks for analysis by chemists and skilled artisans to contribute to improvements in Britain's own ceramics industry.[83]

Joel Mokyr bases his case for an 'industrial enlightenment' on the close integration of theory and practice, on a 'useful knowledge' made up of propositional knowledge and empirical practice. The industrial revolution happened, he argues, because of the close social and cultural integration among those who knew things and those who made things.[84] This optimistic perspective on the close integration of science and technology during the eighteenth century, of an enlightenment informed by empirical practice and an inventive culture is very persuasive. But at the end of the day, Macartney's Embassy failed to express and to convey this image of 'useful knowledge' to the Chinese ruling elite. The inconsistencies of those who planned and took part in the embassy over their own attitudes to knowledge and commerce as well as their assumptions about the Chinese dissipated the wider-world impact of 'industrial enlightenment'.

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83 *Ibid.*

84 Mokyr, *The gifts of Athena*, pp. 35–55, 63–74, 287–91.