

INDUSTRIAL REVOLUTION: A DOCUMENTARY HISTORY

Series Three: The Papers of James Watt and his Family formerly held at Doldowlod House, now at Birmingham Central Library

Part 1: Correspondence, Papers & Business Records, 1687-1819

Part 2: Correspondence, Papers & Business Records, 1736-1848

Part 3: Correspondence, Papers & Business Records, 1736-1848

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Introduction by Nicholas Kingsley, to the Papers of James Watt and his family

These documents were purchased from Lord Gibson-Watt, Doldowlod House, Llandudnod Wells, Powys, in June 1994, with the assistance of the National Heritage Memorial Fund, Victoria and Albert Purchase Grant Fund and many other donors. They are now housed in the Archives Division of Birmingham Central Library with the shelfmark JWP (ACC 94/69)

James Watt

James Watt (1736-1819), surveyor, engineer, mathematical and musical instrument maker, chemist and inventor, is famous for his invention in 1765 of the separate condenser, the crucial refinement of Thomas Newcomen's steam engine. The steam engine as improved by Watt was probably the most important technological advance of the industrial revolution; with the fuel economies of the separate condenser, steam engines could operate anywhere. Later improvements included a new coupling so that the engine could work in both directions, rotative motion, and a governor for safety. By its application to water pumping, hoisting-machinery, the blast furnace, and industrial machinery Watt's engine made possible cheap coal and cheap energy, and powered spinning and weaving, breweries, flour mills, paper mills, the potteries, and many other essential industries.

The authors of *A History of Technology* (Oxford 1958) write that "in 1750 the industrial state, as now understood, did not exist... Britain was then essentially an agricultural and mercantile nation... "a nation of shopkeepers": but by 1815 Britain, and Britain alone, was so far industrialised as to deserve the title of the workshop of the world". The technological changes and developments of those years and the resultant economic growth and social change were based on Watt's great legacy.

Watt began his career in London, where he served an apprenticeship (1755-56) as an instrument maker, subsequently becoming 'Mathematical instrument maker to the College of Glasgow' and opening a shop there. In later years he invented a new micrometer, a new surveying quadrant, and a copying machine, which revolutionised office practice in a way probably not to be matched until the advent of the typewriter in the late 19th century. During the early years of his work on steam, Watt also worked very successfully as a canal surveyor and engineer on various Scottish canals.

In 1774, after the financial failure of his first backer, Dr John Roebuck, Watt joined Matthew Boulton at his Soho Manufactory in Birmingham, and serious exploitation of the steam engine began. Boulton & Watt designed and erected engines in Cornwall and elsewhere during the 1770s, while Watt continually worked to improve the design. A number of significant improvements were realised during the 1780s, one of the most important of which was the invention of the 'sun and planet' gearing system, which allowed the engines to produce rotative motion. Since Boulton & Watt made relatively few of the parts of which their engines were constructed until the 1790s, they preferred not to receive a one-off payment for their engines, but instead to receive a premium calculated as a percentage of the cost savings achieved by use of their engine instead of Newcomen engines producing the same amount of work; Watt invented the horse-power unit of measurement of work performed to make this calculation easier. The system was, however, unpopular with customers, and this and subsequent attempts to pirate Watt's inventions and infringe his patents led to a series of courtroom battles in the 1790s.

While at Birmingham, Watt continued to keep in close touch with his scientific friends in Scotland, particularly Joseph Black and John Robison, but also found himself part of a circle of new friends devoted to improving the world's science, technology, medicine, education and commerce; this became the famous Lunar Society of Birmingham, the most eminent and informal of the provincial learned societies. In addition to Boulton and Watt, members included Dr Erasmus Darwin, Richard Lovell Edgeworth, Samuel Galton junior, the chemist James Keir, Joseph Priestley, the chemist William Small, Josiah Wedgwood, and William Withering. The network of shared contacts of this influential group brought James Watt a steady correspondence of wonderfully rich letters with leading scientists and technologists across Europe; men such as Claude-Louis Berthollet, Aimé Argand, Marsiglio Landriani and J D H van Liender.

The Archive

The Watt papers, formerly in the possession of Lord Gibson-Watt of Doldowlod, Powys, consist of James Watt's personal papers, his extensive incoming correspondence, and bound volumes of retained copies (made on the Watt copying-press) of his outgoing letters; notebooks, journals, personal and business accounts, surveying reports, memoranda, papers relating to the Act of Parliament of 1775 which extended his original patent, patent specifications and drawings for the improvements of the 1780s, legal papers concerning court cases for infringement of his patents, and other miscellaneous papers. These are supplemented by the accounts and letter books of his father, James Watt of Greenock, merchant (1698-1782), from the 1730s to 1780s, and the papers and correspondence of his sons, James Watt junior and Gregory Watt. James junior (1769-1848) succeeded his father at Boulton & Watt from 1800 onwards and was closely involved in the development of the steamboat, turning the engine production of the Soho Foundry increasingly towards marine engines in the 1820s, 30s and 40s. In 1818, the year before his father's death, he took a lease of Aston Hall in Birmingham, and an important collection of drawings relates to the repair and furnishing of the house during the 1820s. In later life, he developed antiquarian interests, and purchased William Hamper's important local history collections relating to Aston, which also form part of the archive. Gregory Watt (1777-1804) was a talented mineralogist and geologist, who died from consumption aged 27; the archive contains a considerable amount of his juvenilia, apparently carefully preserved by his father, who was heartbroken by the early death of a favoured son.

Eight trunks and boxes of the Doldowlod papers were listed in a brief bundle list by the Business Archives Council in 1987; a recent search to make sure that the archive is complete has turned up some additional material, including a further ten folders of James Watt's incoming correspondence, three of his diaries and journals, his father's accounts and much of the miscellaneous material relating to James Watt junior.

Papers relating to the steam engine

Of primary interest to historians of science and technology are the journals and papers relating to the steam engine. There is, for example, an original laboratory notebook [W/14] dating mainly from 1783 recording Watt's experiments on latent heat, copal varnish etc. The experiments on copal varnish are described retrospectively, but the latent heat experiments (including the famous tea kettle experiment) are recorded here as they were performed, with various revisions and pasted cancels in the notes. A folio commonplace book [C1/2] includes Watt's account of his own experiments on heat as well as notes (some from printed reports) on the experiments of Lavoisier, de la Place and Priestley.

Other working papers include notes, drafts, specifications and drawings for steam engine patents and for the various court

cases which arose from patent infringements. Watt himself was responsible for the specifications and drawings in patent applications; and the original parchment patents of 1781, 1782 and 1784 for improvements to the steam engine [G/12-14] include coloured drawings signed by him. A folder of uncoloured draft drawings, with annotations, is also present [C1/43]. Many of the original specifications were later copied for use in court proceedings, notably *Boulton & Watt v Bull* and *Boulton & Watt v Hornblower and Marberly*, and it is these copy drawings which are reproduced by Eric Robinson and A E Musson in *James Watt and the Steam Revolution*. The originals provide greater clarity and a much finer degree of detail than the reproductions. Various objections were raised to Watt's specifications, and the papers here include the autograph draft [4/31] of his answers. There is, too, the manuscript of Professor John Robison's 'Narrative of Mr Watt's Invention of the Improved Engine', prepared for the 1796 Hornblower and Marberly piracy case, in which Robison gives a personal account of Watt's early experiments on steam [3/36].

The early engines were simple albeit massive machines, built on site with local labour and only a supervising engineer from Boulton & Watt. To guide the workmen, Boulton & Watt produced a pamphlet, entitled *Directions for Erecting and Working the newly invented Steam Engine*, 1780. A copy among Watt's papers is copiously annotated with manuscript instructions referring to a particular engine that was being erected in 1788 [W/2]. This is just one example of the many papers, estimates and letters concerning steam engines at work.

James Watt's correspondence

Watt's extensive correspondence is the rich core of the archive, documenting all aspects of his life and work and providing considerable information about his contemporaries. There are more than 4,500 incoming letters, and they are wide-ranging and full to a remarkable degree; as Robinson and Musson have written, "If Dr James Hutton wishes to make a geological map of Cornwall he writes to Watt; if Dr Priestley wishes to have a careful observer of his experiments on gases it is to Watt that he turns; if Berthollet wants to know of the practical developments in chlorine bleaching he consults the man to whom he first explained the properties of gas, James Watt...". The letters are a record of scientific work-in-progress not just in steam but in many other areas. They offer an intimate picture of the close collaboration between scientists and industrialists in the second half of the eighteenth and the first decades of the nineteenth centuries, and reveal how information and views were exchanged.

Of particular note are the letters from Sir Joseph Banks, Thomas Beddoes, Joseph Black, Matthew Boulton, Erasmus Darwin, Humphry Davy, Maria Edgeworth, Richard Lovell Edgeworth, Samuel Galton junior, Thomas Henry, James Hutton, William Irvine, James Keir, James Lind, Joseph Priestley, John Rennie, John Robison, John Roebuck, William Small, Jonathan Stokes, Thomas Telford, James Watt's father and sons, Josiah Wedgwood and William Withering. The overall quality and regularity of the correspondence with scientific and technological figures is exceptionally high. To give just a few examples: Priestley writes about phlogiston, inflammable air, the Lunar Society, and of his losses in the riots (the archive also contains a 1782 manuscript catalogue of his library [C1/411]). Humphry Davy describes his galvanic experiments, including a particularly choice letter on the battery, 1801; Telford writes of his surveying and his designs for London Bridge; Rennie writes to criticise Telford's bridge plans; Dr Beddoes and Darwin write of the medical uses of gases (a particularly full series of letters revealing much about the practical implementation of Beddoes' ideas); and Boulton on all aspects of the Boulton & Watt business. Berthollet sends telling eye-witness accounts of French work on the theory of dyeing and bleaching, the problems of establishing the new chemical nomenclature of the 1780s, and the difficulties of life during the Revolution; Josiah Wedgwood writes about Cornwall (where he and Watt both had business interests), china stone and clay, furnace pipes and the firing details for different porcelains, the slave trade, trade and tariffs, and the political influence of the Chamber of Manufacturers. Watt's letters to Wedgwood and Black were returned to James Watt junior in the 19th century, so both sides of the important correspondences are present in the original, as well as in the retained copies. These are sources that will illuminate areas of great current concern to historians of science, many of whom are now far more interested in the relations between science and experimental and industrial practice than was the case when Robinson and Musson published selections of the letters from the archive c1970. Moving into the realm of business history and the difficult transfer between invention and realisation, the letters from Aimé Argand about the Argand lamp are likely to be a rich source for any study of the financing of innovation in the eighteenth century, as will be Watt's correspondence with Roebuck, Small and Boulton about the financing of the steam engine.

The archive includes a remarkably complete file on Watt's own outgoing letters, largely in press-copies (from 1779 onwards) but supplemented by original letters to his family and retained holograph drafts. Among the earliest letters are those Watt wrote to his father from London in 1755-56 when he was serving his apprenticeship. He describes his work in detail, but also gives a fascinating view of London life, with a young man's ever-present fear of naval impressment. For later years, the press-copy letters form a full record of Watt's side of his many correspondences. Many of Watt's original letters survive in other collections, but for some correspondence these copies will be the only sources. Although some of the copies have faded, the majority are still fresh and legible, and as exact copies, have greater textual authority than most retained copies of the period.

James Watt, junior

As a young man, James Watt junior was sent to Geneva to study languages and natural philosophy under the eye of the scientist J A de Luc (himself a regular correspondent of Watt's). He went on to study in Germany, returned to England in 1788 for two years of practical experience in the counting house of Messrs Taylor and Maxwell of Manchester, and then travelled on the Continent from 1790-94. His early sympathies with the French Revolution led to disillusion with the Terror, and he fled, possibly in some danger, from France to Italy, before returning to England once again. His letters to his father during these years form a fascinating series [W/6, 8; 4/9; C1/33], and like his brother's notebooks, offer an unusual degree of insight into the life of the countries he visited. He joined the firm of Boulton & Watt in 1794, and with Matthew Boulton's son, M R Boulton, was soon playing an important role in the business. The engine patent was to expire in 1800, and since royalty income from the old business of erecting engines on licence was coming to an end, the younger Watt planned and built a new factory (the Soho Foundry) to manufacture engines for sale outright. All the expansion and new expenditure at Soho made his father rather nervous, but within a few years he clearly had the business well in hand. One of the new directions in which he led the firm was steam navigation, and his correspondence includes fine letters from the American steamboat pioneer, Robert Fulton [C1/24; 6/54]. Like his father, he used the Watt copying press to keep a record of his own outgoing correspondence, and there are about a thousand pressed copies of his letters in the archive [LB/7-8; 6/61-65]. Also among his papers are a number of the printed biographical accounts that appeared on James Watt's death, often annotated with corrections, and the autograph manuscript of his anonymous memoir of his father for the *Encyclopaedia Britannica*. Among the miscellaneous papers are plans and drawings for the Watt Institute and Library at Greenock of 1835-37 and the Watt memorial chapel at Handsworth church, 1825-29.

Gregory Watt

Watt's only son by his second marriage, Gregory, was a young man of great promise, whose translations from the classics won a handsome shelf of school prize-books. At Glasgow College he was a fellow-student of the poet, Thomas Campbell, who dedicated to him a memorial volume of verse in 1794. Like his sister before him, Gregory fell ill of consumption, giving an added urgency to his father's work on pneumatic apparatus for his medical friends in the Lunar Society. For his health Gregory lodged for a time in Cornwall with Humphry Davy's mother, and this resulted in young Davy's introduction to Dr Thomas Beddoes and his first employment in the world of science. There are two fine letters from Davy to James Watt reporting on Gregory's health and his own galvanic experiments [C1/21; 6/33]. Gregory's professional interests turned to mineralogy, and he travelled extensively in France, Italy, Switzerland, and Germany in 1801-04, keeping journals full of attractive sketches and writing long and interesting letters to his father and brother. James Watt never really recovered from the tragedy of Gregory's early death in 1804, and for the rest of his life he kept his son's schoolbooks by him in a trunk in his garret workshop. Gregory's only publication was a paper on basalt.

The earlier papers of the two young Watts, like their father's correspondence with R L Edgeworth and some other of his Lunar Society friends, are of considerable interest for the history of education, and have already furnished material for Eric Robinson's 'Training the Captain's of Industry' in Science and Technology in the Industrial Revolution (Manchester, 1969).

Relationship to the other collections at Birmingham

The Archive Division of Birmingham Central Library already held three major archives and a number of smaller collections which have a close relationship to the contents of these papers, and provide the necessary background against which they should be understood, The Boulton & Watt collection, which is owned by the City Council, is the archive of the steam engine partnership from its formation in 1774 until its closure in the 1890s. It includes a wealth of documentation relating to the crucial early years of the business, when James Watt and later his son were directly involved. About 550 volumes of letter books, account books, order books etc. include a sequence of letter books beginning in 1774 which is continuous until the mid 19th century; as in this archive, they comprise retained press copies from the invention to the copying process in 1780. Although there are no order books as such before the 1790s, it has been possible to reconstruct a 'Catalogue of old engines', listing the recorded commissions, and among the 29,000 engine drawings there are surviving designs for almost every one of these. The archive also contains a substantial quantity of incoming correspondence, mostly letters enquiring about orders for engines, and letters from the manufacturers about progress and problems in making the various parts from which the engines were assembled on site. Much of this material has been made available on microfilm by Adam Matthew Publications.

The second major collection is the Muirhead papers, which provide the strongest link with this archive. The Muirhead Papers are also available in their entirety on microfilm from Adam Matthew Publications. J P Muirhead, author of a three-volume work on James Watt published in 1854, was one of James Watt junior's executors, and seems to have had both the records that went to Doldowld and the Muirhead papers at Birmingham in his possession when that work was compiled. A schedule of records in the possession of Watt's solicitors at the time of his death in 1848 certainly includes material now in both collections. In 1870, following a legal case, Muirhead returned to Doldowld the records that remained there until their purchase in 1994. The other material descended in his family, and was presented to the City Council in 1932. The Muirhead papers show clear evidence of this common ancestry, and contain material in almost all the categories present in the Doldowld archive. For example, James Watt of Greenock's account and letter books were at Doldowld, but his vouchers, 1776-79 at Birmingham, and James Watt the engineer's journal-notebooks, 1776-85 are in the Doldowld collection but others covering the period before and after (1768-74, 1786-89) are in the Muirhead papers. The records of his Glasgow instrument-making business are likewise split fairly evenly between the two collections. In other areas, the collections are more complimentary, suggesting a more rational basis for their division; thus although there was a good deal of Watt's correspondence about canals at Doldowld, almost all the canal surveys, accounts and papers were at Birmingham. Papers about property (both Heathfield and in Wales) were mainly at Birmingham too, but the overwhelming majority of Watt's correspondence was at Doldowld (the main groups in the Muirhead papers are letters from the second Mrs Watts, 1779-96 and letters from Priestley, 1778-85). James Watt junior's notebooks, 1796-1835 were held at Birmingham, as were many of his letters from his father, mother and brother Gregory. Finally, the collection at Birmingham explains some absences from the records that were held at Doldowld; for example the papers of James Watt's elder brother John, who drowned at sea in 1763, and his second wife, Ann, are in the Muirhead papers and so was the correspondence which explains how James Watt junior came by Hamper's collections for the parish of Aston.

The third collection of great significance at Birmingham Central Library is the Matthew Boulton papers, placed there on deposit by the Matthew Boulton Trust in 1973, and formerly in the library of the Assay Office in Birmingham. Again, these are being filmed and made available on microfilm by Adam Matthew Publications. With over 200 volumes of records of the Soho Mint and Manufactory, Matthew Boulton's letter books, about 30,000 personal letters received by him in connection with all his wide-ranging business and personal interests (including over 650 from Watt), and the estate and household papers of both Boulton and his son, this is a collection of at least equal importance to the records from Doldowld and on a considerably larger scale. Its significance in this context, however, is that through the networking of the Lunar Society, Boulton and Watt knew and corresponded with many of the same people, often about the same issues. Quite apart from the other members of the Lunar Society itself (Priestley, Darwin, Keir, Small, Wedgwood, etc), there are letters from figures like Aimé Argand, Sir Joseph Banks, Dr Thomas Beddoes, C L Berthollet, Joseph Black, William Chapman, Samuel Garbett, William Hollins, Marsiglio Landriani, J D H van Liender, Robert Mylne, Baron Reden, John Rennie, John Robison, John Roebuck, Sir John Sinclair, Charles Startin, P De Virley, and Zaccheus Walker who appear prominently in the Doldowld papers. Having the letters from Doldowld and those in the Matthew Boulton papers on one site thus affords the opportunity for fascinating cross referencing of the opinions of their correspondents, and reveals much about the character of Boulton and Watt themselves, it can also elucidate many of the obscure asides that appear in the letters. Brought alongside the three collections described above and the Doldowld papers complete an unequalled resource for economic and scientific historians of the late eighteenth and early nineteenth century.

Publications based on the collection

J P Muirhead's biography, *The Origin and Progress of the Mechanical Inventions of James Watt*, 3 volumes, 1854, prints a number of the letters, while Eric Robinson and A E Musson, *James Watt and the Steam Revolution* (London, 1969) and Eric Robinson and Douglas McKie, *Partners in Science* provide a more modern selection; *Partners in Science* specifically printing all the surviving letters between Watt and Black and Robison. H W Dickinson's biography of James Watt (1936) and the collection of essays by Musson and Robinson, *Science and Technology in the Industrial Revolution* also draw on material from Doldowld. A catalogue of the Bullock and Bridgens drawings for furniture etc. was compiled in 1982 by Birmingham Museum & Art Gallery, and supplied the material for an article in *Furniture History*. Despite the efforts of the Gibson-Watts to

accommodate various scholars over the years, while the material was at Doldowlod it was never very accessible and large parts of the collection have never received the sustained attention of scholars. Hamper's collections for the history of Aston, although very different in focus from the rest of the collection, were completely unexplored, and include much that is of significance to local historians in Birmingham.

Acknowledgements

The detailed listing which follows is based upon the brief survey drawn up by the Business Archives Council in 1987 for Lord Gibson-Watt, and is expanded with the assistance of notes and transcripts made at Doldowlod by Jennifer Tann, Julian Gibson-Watt, Ted Hofmann and Joan Winterkorn. The foregoing introduction is quoted largely from reports on the collection by Bernard Quaritch Ltd and Robert Fox. The biographical references at the end of the collection are quoted from the Concise Dictionary of National Biography or abbreviated from biographies in the catalogue of the 1966 Lunar Society exhibition or standard works of reference.

Thanks are due first to Lord Gibson-Watt for allowing access to the collection, and to all those named above who have contributed to the catalogue. Eric Robinson, Neil Cossons, Glenys Wild and Maggie Hamber have all helped by providing information or other assistance with the assessment of the collection.

Nicholas Kingsley, City Archivist, Birmingham Library Services.
(March 1993, revised 1998)

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Publisher's Note

In Series Three of this microfilm project *Industrial Revolution: A Documentary History* we make available all the private papers of James Watt and family which were housed at Doldowlod House in Wales, until their acquisition by Birmingham Central Library in 1994.

Much of this material relates closely to the collections we have already microfilmed in Series One, especially the Boulton & Watt collection, the Matthew Boulton Papers and Muirhead I-IV. The Doldowlod material fills some important gaps and provides correspondence, notebooks and other papers of paramount importance in their own right.

There is excellent correspondence with the following:

Aimé Argand (Swiss physician and scientist) writes about Argand lamps made at Soho, water companies in Paris, visits to French country houses and to see Ministers as well as about James Watt junior's foreign tour.

Sir Joseph Banks (Scientist and President of the Royal Society, 1778-1820). Letters cover many different subjects including lamp glass, gunpowder, the medical use of gases, shrievalty and coinage.

Dr Thomas Beddoes (Physician and founder of the Pneumatic Institute at Clifton in Bristol).

Dr Beddoes and Erasmus Darwin write about the medical uses of gases (a particularly full series of letters revealing much about the practical implementation of Beddoes' ideas).

Claude-Louis Berthollet (French Chemist) sends telling eye-witness accounts of French work on the theory of dyeing and bleaching, the problems of establishing the new chemical nomenclature of the 1780s, and the difficulties of life during the French Revolution.

Dr Joseph Black (Scottish chemist and physician) writes about his experiments in medical chemistry. Letters to and from Black are included here. JWP 4/12 provides a series of letters from James Watt to Dr Joseph Black covering the full range of the men's shared interests. These letters span a variety of subjects from the firing of delft and stoneware, the manufacture of alkali from salt, the invention and manufacture of scientific instruments, the copying-press, the drawing of plans for canals and harbour improvements, the steam engine to discussions of patent law.

Matthew Boulton (Entrepreneur and Engineer). An exchange of ideas, suggestions and instructions between Boulton and Watt on all aspects of the Boulton & Watt business.

William Chapman (Engineer) on business matters.

Charles Clagget (Maker of musical instruments in Dublin) Clagget suggests forming a partnership with Watt, writes about violins and other instruments.

William and Henry Creighton (Engine erectors and agents) in letters to Gregory Watt discuss lead mines, geology, architecture, a tour of Scotland and business affairs.

Erasmus Darwin (Physician) on inventions and experiments.

Sir Humphry Davy (Scientist) Humphry Davy describes his galvanic experiments, including a particularly choice letter on the battery, 1801. Other letters describe his experiments with electricity.

Maria Edgeworth and Richard Lovell Edgeworth (daughter and father, both authors) write about a scheme for a tunnel under the Menai Straits.

Robert Fulton (American scientist and pioneer of steam navigation) discusses various inventions.

Joseph Fry (Physician and entrepreneur) writes about manganese metal, Warltire's lectures and about Hornblower's Radstock engine.

Samuel Galton junior (a Quaker merchant and gunsmith in Birmingham, who began a series of chemical experiments in the 1770s) provides many letters on canal business.

Thomas Henry (Chemist and surgeon-apothecary in Manchester) writes about experiments with chemical bleaching, infringements of his patents and on Watt's pneumatic medical apparatus.

Dr James Hutton (Geologist) writes about minerals.

Dr William Irvine (Chemist) including letter discussing the success of James Watt's engine.

James Keir (Chemist) writes about experiments with alkali and about copying machines.

James Lind (Physician, cousin of James Keir and close friend of James Watt during his Glasgow days) provides letters concerning scientific instruments, ballooning and other attempts at aerial flight, medicine, electrical machines and the legal disputes with the Hornblowers.

Jean Hyacinthe de Magellan (Scientific investigator working on reflecting instruments) writes about his scientific work.

William Murdock (Engineer) discusses engineering projects.

Joseph Priestley (Scientist and theologian). Priestley writes about phlogiston, inflammable air, the Lunar Society, and of his losses in the riots (the archive also contains a 1782 manuscript catalogue of his library [C1/411]).

John Rennie (Civil Engineer). Rennie writes to criticise Telford's bridge plans, about Northfleet Dockyard and other engineering projects.

Industrial Revolution, Series III, Parts 1 to 3

Professor John Robison writes about a wide range of scientific matters.

Dr John Roebuck (Inventor and founder of manufactory of Sulphuric Acid at Prestonpans in 1749, creator of the Carron Company; he sold his interests in the Watt engine to Matthew Boulton in 1773).

He writes about his financial affairs and the sale of his business interests in the 1770s, events in Scotland and the Carron Iron Works.

William Small (Taught philosophy, science and mathematics as Professor of Natural Philosophy at the College of William and Mary in America, before travelling to England and becoming Matthew Boulton's family physician and a key member of the Lunar Society) There are numerous letters to James Watt offering advice and encouragement, particularly on early engine experiments and on the making of accurate scientific instruments.

Jonathan Stokes (Protege of William Withering, interested in pneumatic chemistry, botany and the classification of fossils and plants). He writes about a watch and his scientific work.

Thomas Telford (Engineer). Telford writes of his surveying and his designs for London Bridge, the Caledonian Canal and other projects, especially surveys of Scotland.

James Watt's father (James Watt of Greenock, 1698-1782). In addition to the correspondence between father and son, there are account books and other business papers reflecting his father's activities in Scotland. Also included are the surveying papers and mathematical notes of John Watt of Crawforddyke. This links up with material already covered in the Muirhead collection.

James Watt's first wife (Margaret Miller, died 1773): see especially JWP 4/4 and 4/63.

James Watt's sons (James Watt junior and Gregory Watt). Of particular note are James Watt junior's letters describing his travels in Europe, especially news from Paris in early 1790s. Gregory Watt describes his stay with the Davys and his tour in Germany, Switzerland and France.

Josiah Wedgwood (Master potter at Etruria factory in Staffordshire; Chairman of the General Chamber of Manufacturers). Josiah Wedgwood writes about Cornwall (where he and Watt both had business interests), china stone and clay, furnace pipes and the firing details for different porcelains, the slave trade, trade and tariffs, and the political influence of the Chamber of Manufacturers. There is also much reference to Lunar Society business. In JWP C1/10 Wedgwood describes visits to Sir Richard Arkwright. Watt's letters to Wedgwood were returned to James Watt junior in the 19th century, so both sides of the important correspondences are present in the original, as well as in the retained copies.

William Withering (Physician, botanist and mineralogist). A whole range of letters cover prescriptions, experiments and money matters.

The overall quality and regularity of the correspondence with scientific and technological figures in England, Scotland, on the Continent of Europe and even wider afield is remarkable. This stretches far beyond members of the Lunar Society and includes important industrialists such as Samuel Whitbread, William Wilkinson, Sir Richard Arkwright, David Dale and Samuel Garbett.

As Nicholas Kingsley points out in his Introduction:

"These are sources that will illuminate areas of great current concern to historians of science, many of whom are now far more interested in the relations between science and experimental and industrial practice than was the case when Robinson and Musson published selections of the letters from this archive in the early 1970s. Moving into the realm of business history and the difficult transfer between invention and realisation, the letters from Aimé Argand about the Argand lamp are likely to be a rich source for any study of the financing of innovation in the eighteenth century, as will be Watt's correspondence with Roebuck, Small and Boulton about the financing of the steam engine".

There are also letters from Henry Smeathman about the abolition of slavery, trade with West Africa, the black poor in London and their possible re-settlement in Sierra Leone.

A complete file of Watt's own outgoing letters, largely in press-copies (from 1779 onwards) but supplemented by original letters to his family and retained holograph drafts, are an important part of this archive.

Among the earliest letters are those Watt wrote to his father from London in 1755-56 when he was serving his apprenticeship. He describes his work in detail, especially instrument making and surveying, but also gives a fascinating view of London life, with a young man's ever-present fear of naval impressment. Letters for 1774-1775 describe to his father the events following his arrival in Birmingham, see JWP 4/60. For later years, the press-copy letters form a full record of Watt's side of his many correspondences. The recipients include Dr Joseph Black, Josiah Wedgwood, Robert Muirhead, James McGrigor, Gilbert Hamilton, Captain Marr, J H de Magellan, Matthew Boulton, James Keir, William Chapman and many others. Many of Watt's original letters survive in other collections, but for some correspondents these copies will be the only sources. Although some of the copies have faded, the majority are still fresh and legible, and as exact copies, have greater textual authority than most retained copies of the period.

Within Series Three the correspondence is the main focus of Parts 1 and 2.

Other important sections included in Parts 2 and 3 are:

Diaries, account books and memoranda books

These reveal much about James Watt and his working methods. There are inventories of his tools, scientific instruments and accounts of expenditure. The diaries include details of trips to London, a visit to the Hawkesbury Colliery and details of his engines. His small octavo journal for 4 January - 2 July 1779 records his thoughts on the Paris water supply, drawings for the Poldice steam pipe, lists of other drawings made and letters written, provides information on his health, the visits of Wilkinson and Darwin to Soho, a report on a leaking engine and how it was repaired as well as offering details on his experiments with copying machines.

Business records: instrument making

Again there is much evidence about working practices, the making of scientific instruments, mathematical calculations and the precise attention to detail.

Business records: surveying

These papers cover the period c1755-1774 and include work on surveys of the River Clyde, the Port of Glasgow, Ayr harbour, numerous canals, Watt's Report to HM Commissioners for managing the annexed estates in Scotland concerning the isthmuses of Tarbert and Crinan, a Report and Survey on the Rivers Forth and Devon with Lord Cathcart's notes and remarks upon Watt's work, survey work for the construction of Hamilton Bridge and Rutherglen Bridge as well as various schemes for road construction.

Business records: steam engines

Covering this crucial area of Watt's business there are a wealth of different papers ranging from a volume of Copy specifications of various inventions from Thomas Savery's patent of 1698 to Robert Cameron's patent of 1784, compiled no doubt with regard to one of Watt's many patent applications, drawings of an engine for the Carron Company, Acts of Parliament, manuscript copies of all James Watt's specifications and mechanical improvements, correspondence through to details of individual experiments.

Papers concerning Watt's various legal battles

These record his ongoing troubles with the Hornblowers and in particular: The steam engine patent extension of 1775, legal cases including Boulton versus Bull, 1781-1799 and also Boulton & Watt versus Hornblower & Maberly, 1775-1799.

Business records: copying machines

The copying machine was a most important contribution by James Watt to commercial practice allowing the easy making of press copy letters, which remained a central facet of all businesses until the advent of the typewriter in the late nineteenth century. JWP C1/39 contains the parchment patent of 1780.

Family Papers of Gregory Watt and James Watt junior

Gregory Watt was the only son of James Watt's second marriage. A young man of great promise, with an excellent knowledge of the classics, Gregory suffered prolonged ill health and died at the early age of 27. For health reasons Gregory lodged for a time in Cornwall with Humphry Davy's mother, and this resulted in young Davy's introduction to Dr Thomas Beddoes and his first employment in the world of science. Excellent letters in the collection from Davy to James Watt reporting on Gregory's health and his own galvanic experiments can be found in JWP C1/21 and 6/33. Gregory travelled extensively in France, Italy, Switzerland, and Germany in 1801-04, keeping journals full of attractive sketches and writing long and interesting letters to his father and brother. James Watt never really recovered from the tragedy of Gregory's early death in 1804, and for the rest of his life he kept his son's schoolbooks by him in a trunk in his garret workshop. Gregory's only publication was a paper on basalt.

James Watt junior's papers are very important because of his central role in carrying on the Boulton & Watt business along with Matthew Boulton's son from the late 1790s onwards.

James Watt junior joined the firm in 1794. He was responsible for the building of the new factory (the Soho Foundry) to manufacture engines ready for immediate sale. This was completed in 1795. James Watt junior developed the business in various new directions, in particular steam navigation, after 1800. There are excellent letters in the collection both to and from the American steamboat pioneer, Robert Fulton. A new focus became necessary with the expiry of the engine patent in 1800 and dwindling royalty revenue from the old business of erecting engines on licence.

As Nicholas Kingsley mentions, the earlier papers of the two young Watts, like their father's correspondence with R L Edgeworth and some other of his Lunar Society friends, will be of considerable interest to scholars of the history of education. These papers have already furnished much material for Eric Robinson's 'Training the Captain's of Industry' in Science and Technology in the Industrial Revolution (Manchester, 1969).

"The importance of these papers to historians of science, technology, industry, the economy, applied art and society in the Industrial Revolution cannot be over-estimated."

Professor Jennifer Tann
University of Birmingham

"If Dr James Hutton wishes to make a geological map of Cornwall he writes to Watt; if Dr Priestley wishes to have a careful observer of his experiments on gases it is to Watt that he turns; if Berthollet wants to know of the practical developments in chlorine bleaching he consults the man to whom he first explained the properties of gas, James Watt..."

Eric Robinson and A G Musson

authors of James Watt and the Steam Revolution (London 1969)

and the collection of essays in Science and Technology in the Industrial Revolution

which draw heavily on the Doldowlod material which is now made more widely accessible to researchers throughout the world through this project to comprehensively microfilm all these papers.

A single paperback guide accompanies all three parts of Series Three of this microfilm project.

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Technical Note

Our microfilm publications have been prepared and produced in accordance with recommended and established guide-lines for the production of microform of superior quality. These conform to the recommendations of the standard guides to good microforming and micropublishing practice.

Attention should be drawn to the nature of the original material. All the material consists of bundles and files containing correspondence, drawings and loose papers as well as some volumes of printed material, diaries, journals, notebooks and other bound items such as letter books, accounts and day books. Most of the material is in very good condition. A few manuscript documents consist of faintly legible correspondence and records written with a variety of inks, pens or pencils and on paper of many different types and thicknesses. A few items are stained or discoloured at the edges, or comprise material on very thin paper, which is so thin that there is show through that renders the original document difficult to read. A few items such as the Letter Books pose problems where the original is very faint.

These original characteristics present difficulties of image and contrast which stringent tests and camera alterations cannot entirely overcome. Every effort has been made to minimise these difficulties. An A4 identification target is filmed at the front of every new item.

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Detailed Listing - Part 1

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Catalogue of the Papers of James Watt, James Watt junior and Gregory Watt formerly held at Doldowlod House (1 red spiral bound volume)

James Watt of Greenock, 1698-1782
Personal correspondence from his son James Watt the Engineer

JWP 4/11 1754-1774 Letters from his son concerning the progress of his instrument-making, surveying and other business affairs. (161 documents)

JWP 6/46 1755-1756 Letters and a few accounts from James Watt during his apprenticeship, describing life in London. (36 documents)

JWP 4/60 1774-1775 Letters from James Watt following his move to Birmingham: "I am arrived here yesterday" [1 June 1774]; "The business I am here about has turned out rather successful; That is to say that the fire engine I have invented is now going, and answers much better than any other that has yet been made & I expect will be very beneficial to me..." [11 December 1774], and reporting the success of the Bill to extend the patent: "This affair has been attended with great expence, and without many friends of great interest I should never have been able to carry it through, as many of the most powerful people in the house of commons opposed it." [8 May 1775]. (4 documents)
James Watt of Greenock, 1698-1782 Business records

JWP C4/A1 1729-1732 Account book. (1 volume)
JWP C4/A2 1730-1734 Cash and stock book. (1 volume)
JWP JW/15 1732-1770 Miscellaneous accounts and papers. (230 documents)

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JWP JW/16 1733-1773 Miscellaneous accounts. (91 documents)
JWP JW/17 1733-1774 Miscellaneous accounts. (64 documents)
JWP JW/18 1734-1776 Miscellaneous accounts. (71 documents)
JWP JW/19 1735-1771 Miscellaneous salt and other accounts. (76 documents)
JWP C4/A3 1737-1740 Letter book, entitled 'Orders to build the Ronak'. (1 volume)
JWP C4/A4 1740-1741 Letter book. (1 volume)
JWP JW/21 1740-1773 Miscellaneous accounts of James Watt and others. (54 documents)

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JWP JW/20 1740-1787 Miscellaneous accounts. (14 documents)
JWP C4/A5 1743 Letter book, with single sheet of accounts. (1 volume)
JWP C4/A6 1746-1749 Letter book. (1 volume)
JWP C4/A7 1748-1749 Day book. (1 volume)
JWP C4/A8 1749-1751 Letter book. (1 volume)
JWP C4/A10 1749-1750 Account for the ship Crawford. (1 volume)
JWP C4/A9 1750 Accounts of Robert Finlay with James Watt etc. (1 volume)
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JWP C4/A12 1753 Day book. (1 volume)
JWP C4/A14 1753-1754 Ledger. (1 volume)
JWP C4/A13 1753-1755 Invoice book. (1 volume)
JWP C4/A15 1759-1760 Account book. (1 volume)
JWP C4/A16 1761 Account book. (1 volume)
JWP C4/A17 1761-1763 Ledger (marked LG 1762 inside cover). (1 volume)

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JWP C4/A18 1763-1764 Account book. (1 volume)
JWP C4/A19 1764-1766 Ledger (marked H on spine). (1 volume)
JWP C4/A20 1767-1770 Account of Lads' work. (1 volume)
JWP C4/A21 1768 Account book. (1 volume)
JWP C4/A22 1769 Account with the town of Greenock. (1 volume)
JWP 4/68 1769-1787 Bundle of papers concerning Greenock accounts. (12 documents)
JWP C4/A23 1770 List of sundry debts from Ledger I. (1 volume)
JWP C4/A24 1771 Small account book marked 'No 2'. (1 volume)
JWP C4/A25 1772-1773 Account book. (1 volume)
JWP C4/A26 1776 Inventory of goods, taken 15 January 1776. (1 volume)

John Watt of Crawforddyke, 1687-1737

The items listed below are attributed to John Watt, teacher and surveyor, on account of their content. They were probably used later by James Watt the engineer when he became a land surveyor.

JWP C4/B32 (1682)-c1730 "Navigation in all its parts", including a transcript of 'The articles, settlement and offices of the Free Society of Traders in Pennsylvania', (1682) and John Partridge's 'prophecy of the present year 1684'. (1 volume)

JWP C4/B28 1732 "Some questions of the square root and obliquae trigonometre" and "Great Circle Sailing". (1 volume)

JWP C4/B29 nd Damaged volume on mathematics and navigation. (1 volume)

REEL 5

JWP C4/B30 nd "Traverse sailing, Case 2d". (1 volume)
JWP C4/B31 nd Loose sheets (i) 9-28, 37-44, 65-72 headed "Chapter III" on page 9 and (ii) "oblique sailing", pp5-12. (1 bundle)
JWP C4/B34 nd "Algebraic Questions". (1 bundle)
JWP C4/B35 nd "Geometrical Definitions". (1 volume)
JWP C4/B36 nd Navigational and astronomical tables, no title but marked with a star and "sun and moon 1710". (1 volume)

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James Watt, 1736-1819 Press copy letters

Most of the press copies are carefully pasted into folio albums that are closely similar to those generated by Boulton & Watt. Most the copies are surprisingly legible but some (eg LB/5) very faded. They contain almost the whole of Watt's out-letters from 1779 (the year before he patented the copying machine) until his death. Some early press copy letters to Boulton and Keir are included in folder 3/8.

JWP W/5 1779-1781 Folder of press copies of letters written by James Watt to Dr Black, Josiah Wedgwood, Mr Nivien, Robert Muirhead, James McGrigor, Gilbert Hamilton, Captain and Mrs Marr, Mr Rathbone, Mrs Watt, Mr Dunlop, and J H de Magellan. One of these is almost certainly the earliest surviving press copy letter in the world. Several letters are very fragile and faint. (1 bundle)

JWP 3/8 1781-1783 Press copies of private letters from James Watt to Matthew Boulton and James Keir, 1781-82. The letters to Keir mostly concern the manufacture of alkali and the copying machine; at fol.2v the recipe for the copying ink is given. (1 folder).

Also included are a few loose letters, including one from Matthew Boulton to Robert Cameron, 1782, referring to his offer to go out to the West Indies to erect rotative engines to work sugar mills, and another from Boulton to William Chapman at Newcastle, about a proposed sole agency for the sale of Boulton & Watt engines at collieries within thirty miles of Newcastle, 1783.

JWP 3/18 1782 Bound folder of press copy letters titled 'No 9 Cornwall', February - April 1782, including a number of long letters to Matthew Boulton. (1 folder)

REEL 6

JWP LB/1 1782-1789 Private letter book. Includes about 400 letters on 287 ff. (1 volume)

REEL 7

JWP LB/2 1789-1797 Private letter book. Contains about 450 letters. (1 volume)

REEL 8

JWP LB/3 1797-1803 Private letter book. Includes about 500 letters. (1 volume)

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JWP LB/4 1803-1810 Private letter book. (1 volume)

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JWP LB/5 1810-1818 Private letter book. (1 volume)

REEL 11

JWP LB/6 1818-1819 Private letter book. Includes about 100 letters. (1 volume)

James Watt, 1736-1819
Personal Correspondence

JWP C1/36 1761 Letter from Alexander Cumming regarding pipes for a portable organ, 27 December 1761. (1 document)

JWP 4/7 1761-1769 Letters from his father, James Watt of Greenock, including one asking if he knows anyone who can repair the fire engine at Greenock (presumably a fire-fighting engine), and another about the death of his brother, John Watt, at sea. (70 documents)

JWP 4/4 1761-1773 Letters between James Watt and his wife Margaret, née Miller, ending with her last letter and a doctor's letter sending news of her death. (44 documents)

JWP 4/87 1762-1767 Letters from Alexander Cumming: "I am glad that you succeed so well in organ building. I make no doubt but you'll get the better of all obstacles, but I think your studying a little of thorough Bass wou'd make you [better] acquainted with the relation of the different stops, than you can by any other means be"; R Cooper and Erasmus Darwin (with drawing of a chaise) "...Now my dear new Friend, I first hope you are well, and less hypocondriac; and that Mrs Watt and your child are well. The plan of your Steam Improvements I have religiously kept secret, but begin myself to see some difficulties in their execution, that did not strike me when you was here. I have got another new Hobby Horse since I saw you. I wish the Lord would send you to pass a week with me and Mrs Watt along with you, - a Week! - a Month!, a Year". (3 documents)

JWP C1/38 1763 Letter from Charles Clagget, suggesting that he sells Watt's musical instruments in Dublin as a partner or on an agency basis, 30 September 1765. In his early years as an instrument maker Watt interested himself in the manufacture of musical instruments including guitars, violas and fiddles as well as flutes and organs. He used his mathematical knowledge of harmonics to compensate for his deficiency of ear. He was so successful that Clagget, who had a musical instrument shop in Dublin, offered him a partnership. (1 document)

JWP C1/15 1764-1799 Letters exchanged by James Watt and Dr James Lind. Lind, was a cousin of James Keir and a close friend of Watt during his Glasgow days, and in the 1790s. In the 1760, he and Watt corresponded about scientific instruments; later Lind was interested in ballooning and other attempts at aerial flight. These letters provide unique information about the ballooning craze of the 1790s, when Watt was a correspondent of Cavallo (see W/9, Part 2, Reel 22). Other subjects include medicine, James Keir, Boulton's explosive balloon, electrical machines. (1 volume, some loose letters)

JWP 4/16 1765-1768 Letters from Lord Alva, John Lean, Sarah Levisson, Messrs Love and Manson, John Wyke re business matters. (7 documents)

REEL 12

JWP 4/32 1765-1775 Letters from Dr John Roebuck and Dr James Lind. (126 documents, being 34 letters plus papers)

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JWP 4/57 1765-1775 Letters from Dr John Roebuck. Both this and 4/32 (the previous bundle) date from the years when Roebuck was Watt's partner in the development of the steam engine. "...You are letting the most active part of your life insensibly glide away. A Day a Moment ought not to be lost. And you should not suffer your Thoughts to be diverted by any other subject or even improvement of this but only the speediest and most effectual manner of executing one of a proper Size according to Your present ideas..." Extracts of some of these letters have been published in James Watt and the Steam Revolution (25 documents)

JWP C1/14 1767 Letter to an unnamed correspondent, describing his newly-invented micrometer, 9 September 1767: "It gives me great pleasure when I can communicate even a new trifle to my friends. With this view, I send the description of a micrometer I think new..." (1 document)

Accurate instrument making was very largely dependent on the invention of accurate micrometers, Watt was a pioneer in this field and corresponded extensively with such people as William Small and James Lind on this subject. It was pointed out to him that Peter Dollond (1730-1820) had been granted a patent for a micrometer which Watt himself had invented some years earlier, but Watt was always unwilling to challenge other people's patents, knowing how often his own where contested. The unfortunate experience of Arkwright, whom Watt tried to assist in the defence of his patent, only strengthened his determination not to challenge the patents of others.

JWP 4/82 1767-1796 Bundle of miscellaneous letters and papers of James Watt, mostly drafts and press copies of letters by Watt, but also including letters from Dr Lind and Lord Cathcart; much about surveying including 3 sketch maps of North Side of West Loch Tarbert surveyed by Watt in 1771 and note on Crinan Canal. (30 documents)

JWP 4/41 1768-1770 Letters from Thomas Handley, the solicitor who acted for Watt in obtaining the patent of 1769; this bundle includes the bill for drawing up Watt's patent specification. (7 documents)

REEL 13

JWP 4/39 1768-1774 Letters from Dr Joseph Black, published in Partners in Science (20 documents)

JWP 4/59 1768-1775 Letters between James Watt and Dr William Small, about the development of the steam engine and other matters, Watt writes [20 October 1769] "You say you are not discouraged by our experiment. I own I am, not that I believe it impossible for the engine to succeed but the constant succession of new difficultys must at last make me sink under them and abandon it. I find myself always less and less fruitful in Expedients to remedy the faults that occur..." [and August 1772]: "...Although I am out of pocket a much greater sum in these experiments that my proportion of the property in the engine, I do not look upon that money as the price of my share but as money spent on my education. I thank God that I have now reason to believe that I can never while I have health be at any loss to pay what I owe, and to live at least in a decent manner, more I do not violently desire..."

Also includes a letter of Matthew Boulton to Watt, written immediately after Small's death on 25 February 1775: "Dear Watt, You have lost a friend so have I. Take him all in all we ne'er shall see his like again. My loss is as inexpressible as it is irreparable. I am ready to burst. I can't write more but remain Your inconsolable and affectionate Friend, Matthew Boulton. [PS] Acquaint Dr Roebuck - I can't." (6 documents)

JWP 4/12 1768-1799 Letters from James Watt to Dr Joseph Black, returned to Watt by Black's executors after his death. All these letters have been published in Partners in Science, they are some of the most important letters in the collection, dealing in detail with the full range of the two men's shared interests. Watt's letters cover the firing of delft and stoneware, the manufacture of alkali from salt, the invention and manufacture of scientific instruments, the copying-press, the drawing of plans for canals and harbour improvements, the steam engine, and patent law, eg; no.42, 6 June 1784: "...Previous to your letter I have heard much of Mr Cort's process for making bars and have seen a great deal of his Iron, though I cannot perfectly agree with you as to its goodness yet there is much Ingenuity in the Idea of forming the bars in that manner, which is the only part of his process which has any pretensions to novelty. The kind of Iron you describe is one of the modifications of Cold short Iron and is known here by the emphatical name of rotten tough...Mr Cort has as you observe been most illiberally treated by his trade - they are ignorant brutes; but he exposed himself to it by exposing his process to them before it was perfect, and they saw his ignorance of the common operations of making Iron, laughed at and despised him; yet they will contrived by some dirty occasion to use his process...without acknowledging him in it. I shall be glad to be able to be of any use to him." (59 documents)

JWP 4/24 1769 Letters and papers between James Watt and Dr William Small, including draft specification for Watt's steam engine patent and one letter from Dr Small. (7 documents)

JWP 4/50 1769-1773 Letters from various correspondents concerning the port of Glasgow, the Monkland Canal and the River Clyde. (30 documents)

JWP 4/33 1769-1776 Letters, mostly from Mr Morrison of Alloa, regarding canals, Caledonian Canal, surveying etc. (23 documents)

JWP 6/19 1769-1776 Letters, mostly from Matthew Boulton, and mostly of 1775-76; much about the Engine Bill in Parliament, and several refer to Small's funeral, estate etc. One letter records how a rival was so depressed at seeing how well a Boulton & Watt engine worked that he gave the model of his own engine to M R Boulton [then aged six] in disappointment. Another refers to Watt's consideration of the offer of a post in Russia: "...Your going to Russia staggers me. The precariousness of your health, the dangers of so long a journey or voyage, and my own deprivation of consolation renders me a little uncomfortable, but I wish to assist & advise you for the best without regard to self." Also includes letters from James Keir and John Fothergill. (32 documents)

REEL 14

JWP 6/44 1769-1827 Letters, mostly from Dr Roebuck to Matthew Boulton, 1769-80, including his offer to sell his share of the steam engine patent, but also including a letter from W Matthews to Watt, 1775 and one from Josiah Roebuck to James Watt junior, 1827.(9 documents)

JWP 4/80 1770-1771 Letters exchanged between James Watt, William Sandeman and Hector Turnbull about a watermill to drive a mangle. (5 documents)

Industrial Revolution, Series III, Parts 1 to 3

JWP 6/38 1770-1771 Letters from William Alexander about a water engine, wheel and pumps for a coal mine in Scotland. (12 documents)

JWP 4/51 1770-1773 Letters from Charles Gascoigne and William Cadell of the Carron Company. (13 documents)

JWP 4/3 1770-1773 Letters from his father, James Watt of Greenock, mainly containing personal news but also about surveying etc. (28 documents)

JWP 4/19 1770-1773 Letters from various correspondents, mostly concerning the Monkland Canal. Includes letters from Van Liender, John Smeaton, J Naismith, James Montgomery of Ayr: "I have the pleasure to inform you that on 21st Curr, our Engine was sett agoing and answers to the utmost extent of our hopes, she goes admirably well and we are proceeding with our sinking...Our man John Scot I believe will go mad with Joy at his success, our Engine going so far superior to that of our Neighbours. I mean Mr Bewmounts, I must own he hath surpast my expectations both as to time and Workmanship..." Peter Colevile, Mr Ferguson, W Mather, Lord Cochrane and Dr Alexander Wilson. (39 documents)

JWP 4/62 1770-1773 Letters regarding Watt's survey of the isthmuses of Crinan and Tarbert, with a four-page journal of work done. (23 documents)

JWP 6/47 1771-1772 Letters from James Keir describing his experiments with alkali [published in Partners in Science]. (2 documents)

JWP JW/24 1771-1773 Letters from Charles MacDowal about surveying. (8 documents)

JWP 4/40 1772-1773 Letters from various correspondents, including his father about supplying the town of Greenock with water. (8 documents)

JWP 4/10 1773-1775 Letters from Lord Cathcart regarding surveying prospects in Scotland, with two from Mr Callendar and several from the Devon Navigation Company. (22 documents)

JWP 6/37 1774-1775 Letters from Captain Marr on a campaign in Canada and Miss Betty Miller, Watt's sister-in-law. (14 documents)

JWP 4/20 1774-1776 Letters from Gilbert Hamilton and Robert Muirhead about various family and business matters including weaving, schools, Bo'ness Canal. Muirhead is glad to hear of the success of the engine but complains of "...the d---n'd abstruse subjects you write about" (33 documents)

JWP 4/76 1774-1776 Letters from various correspondents, including Dr Hutton, Patrick Wilson, George Clerk (re Black, Priestley, and tobacco sales in 1775), Van Liender. (12 documents)

JWP C1/40 1775 Letter from Erasmus Darwin, urging Watt not to go to Russia, 29 March 1775. (1 document)

John Robison had passed on an invitation to Watt from the Empress Catherine to become Master Founder of Iron Ordnance to Her Imperial Majesty in 1771, and when Watt feared that the steam engine enterprise would founder in 1775, he talked of taking up the offer. Boulton also wrote to try to dissuade him (see JWP 6/26, Part 2, Reel 38)

JWP 4/18 1775-1776 Letters from George Anderson, Robert Barclay and Mrs Cochrane about accounts. (3 documents)

JWP 3/38 1775-1790 Letters from various correspondents, grouped in three small bundles, as follows: a) four letters, including Erasmus Darwin, asking for information on steam engines suitable for a note in his forthcoming Economy of Vegetables; b) eight letters from various correspondents, 1775-77; c) ten letters from various correspondents, 1778-90 including one from Samuel Wyatt sending plans for Heathfield House, 1789 [plans not present]. (22 documents)

JWP 4/17 1776-1781 Letters from various correspondents, including Josiah Wedgwood (re an engine lathe, 1779), Charles MacDowal (re engines and a canal), Charles Clagget (re violins), George Clarke, Michael Bogle, James Buchanan, Rev Lawson, Frederick Augustus Muller, J Palmer and Samuel Galton junior: "I have sent by my servant two small quantities of the Tartarous Acid one in a fluid the other in a mucilaginous state, I observed this morning that it precipitates lead from the acid of Vinegar, whether this be consistent with the affinity of the Acid or whether it be combined with any part of the Vit. Acid employed to decompose it I do not know. Dr Black's method was implicitly followed. The Tartar and lime were boiled it is true in an iron kettle lined with Tin and the mixture put into a vessel glazed with lead - can this be any defect in the process?". (12 documents)

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JWP 4/21 1776-1786 Letters from his cousin, Jean Cochrane, who acted as Watt's agent in Scotland. (9 documents)

JWP 4/36 1776-1796 Letters from Jonathan and Jabez Hornblower. Jonathan Hornblower (snr) writes about Tingtang Colliery; Jabez writes business letters from Pwllheli and Penryndee. (52 documents)

JWP 4/15 1777-1780 Letters from Gilbert Hamilton, Robert Muirhead and Mr McGrigor about business and family matters, [see JWP 4/20, Reel 14 for similar earlier material]. (31 documents)

JWP 6/48 1777-1805 Letters mainly from John Roebuck junior and John Woodward, 1790-1805, but including one from Dr Roebuck about Henry Moyes, the blind scientific lecturer, 1777. (9 documents)

JWP C1/28 1778 Letter from Dr William Irvine, discussing among other matters the success of Watt's engine. (1 document)

JWP 4/49 1778-1781 Letters from Dr Patrick Wilson regarding copying machine. (3 documents)

JWP 6/36 1779-1789 Letters from Watt to Josiah Wedgwood, returned to James Watt junior by T Wedgwood in 1847, with a covering letter of that date. Watt's letters concern a flint mill, engine lathe, business interests in Cornwall, geology of Cornwall, warning of French engineers looking for industrial information, copper trade and Cornish Metal Co. (46 documents)

JWP C1/27 1780 Letter to Rev Mr Deane regarding the education of James Watt junior, 2 November 1780. (1 document)

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JWP 6/21 1780-1786 Letters from William Matthews, Watt's banker and agent in London, regarding engine and canal business, money etc, and arranging for James Watt junior to go to Geneva. (25 documents)

REEL 16

JWP 4/44 1780-1799 Letters between Watt and Dr Joseph Black published in Partners in Science and including four letters to J H Magellan. (71 documents)

JWP 4/47 1780-1799 Letters from Dr William Withering, about prescriptions, money etc. (34 documents)

JWP C1/32 1781 A letter from his son James Watt junior, enclosing a sample of his drawing, 19 September 1781. (1 document)

James Watt laid considerable stress on the education of his children in the ability to draw; not only machine drawings, but also freehand drawing because of its importance in design. Both Boulton and Watt established school for apprentices to learn drawing.

JWP 4/81 1781 Letter from James Keir regarding the copying machine. (1 document)

JWP C1/26 1781 Letter from Dr William Withering about his experiments, 21 November 1781. (1 document)

JWP 4/9 1781-1787 Letters in French and German relating to James Watt junior's foreign tour. Correspondents include M. Carpentier, M. Reinhard, Baron Reden, Professor Lempe, J A de Luc, M. De Lessert, Dr Odier, Aimé Argand and M. Guyot. (41 documents)

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JWP 4/43 1781-1789 Letters from Gilbert Hamilton, Robert Muirhead and James McGrigor, mostly regarding family matters. (67 documents)

JWP JW/22 1781-1790 Letters from various correspondents (mainly from Scotland) including Dr Roebuck, Professor Robison, John Austin, Mrs Campbell of Glasgow, David Dale, Dr Patrick Wilson, Andrew Wilson: "...as Helen and Anna were pretty much blackened going thro' your works at Soho I left them to bathe to their necks at the Citadel at Leith...", Charles MacDowal, W Craig and Robert Muirhead. (46 documents)

JWP 4/48 1781-1790 Letters from various correspondents, including Sir Joseph Banks, John Smeaton (about problems with copying drawings), J H de Magellan, M. Guyot, and Dr Thomas Percival of Manchester: "In a conversation which I enjoyed with Dr Priestley, who lately paid me a short but very friendly visit, I learned with much satisfaction, that you have accomplished a method of destroying smoke, which issues from fire engines, furnaces and other works. I am solicitous to receive further information concerning a discovery, which promises to be of great importance to the inhabitants of Manchester, who appear to be particularly incident to pulmonic affections; and I am apprehensive will become more so, from the rapid increase of the cotton manufactory. The fumes which arise from the Burning of velvets, are extremely acrimonious and offensive to the lungs. And they are so copious, even from a single chimney, as to scatter a shower of soot over a very considerable space. It is my intention to make a representation to our Magistrates at the ensuing Quarter Sessions, or the expediency and necessity of adopting some measures for the purification to the air of Manchester. For they are the guardians of the health as well as the morals of their fellow citizens and though works which are necessary for the prosecution of trade, ought not to be deemed nuisances, the persons who are engaged in them, should be induced, or enjoined, to conduct them in a manner as little injurious as possible to the public." (14 documents)

JWP 6/17 1781-1805 Letters from Professor Robison about a wide range of scientific matters, all published in Partners in Science. (38 documents)

JWP C1/17 1782 Letter from James Keir about the sale of a (?copying) machine, 5 January 1782. (1 document)

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JWP JW/23 1782-1787 Letters from various correspondents including Joseph Fry (news of Hornblower's Radstock engine etc), Charles Clagget, John Knox, W Chapman, J Baddeley, Daniel McMillan, G Goodwin, J Ingram, W Morehead, Pochin Lister, W Playfair, J Alston, Hugh Warden, Charles Startin, John Bengo, Henry Smeathman (about the settlement of Sierra Leone):

"...You will observe by my plan of settlement, that Blacks and Persons of Color, have a most favourable opportunity, through the benevolence of Government, of enjoying great advantages, and the Public will be relieved from a great burden for the greater part of those unfortunate persons come to the Parish. If I could have this same bounty with whites, for it amounts to £14 each person, it would be possible to engage several thousand in a month, Upward of 340 have entered voluntarily to go with me. Many of the Black Men have white wives and the Black women white husbands, and there are among them all kinds of useful tradesmen", Dr Jonathan Stokes and Samuel Whitbread: "Your engine put up for me has universal Credit and many Gentlemen of the first rank have seen it by which means it has come to his Majesty's ears that he has told me he has a desire to see that the Brewhouse also accompanied by the Queen and expect it will be within a fortnight but no day yet fixed. Now Sir, as the Engine does you so much honor I do wish you to be present as the information you can give his Majesty will be highly pleasing to him and you will oblige me but that need not be added as an inducements. I beseech you not to mention this matter to any person whatever but favour me with your answer that you hold yourself in readiness...". (36 documents)

JWP 6/27 1782-1788 Letters from Josiah Wedgwood about Cornish clay, china stone and china clay, furnace pipes, thermometers for use in kilns, the slave trade, and the political influence of the Chamber of Manufacturers: "I congratulate you, and every friend to the manufacturing interest of Great Britain, upon the disposal of the intended treaty with Ireland. It is an epoch in our commercial history, and a very flattering one to our infant institution of the Chamber of Manufacturers, and I trust will open the eyes of those who have hitherto kept them shut to the utility, not to say the necessity of such an establishment; and now is certainly the time in which its members & friends should by every means in their power recommend it to the notice and protection of the public." (20 docs)

JWP C1/29 1783 Letter from Joseph Fry about manganese metal and his attendance at Warltire's lectures, 1 February 1783; and on the same sheet, a letter from William Jones about the particulars of a steam engine. (Originally part of JWP JW/23). (1 document)

JWP C1/31 1784 Letter from his son, James Watt junior, about the progress of his education, 29 September 1784. (1 document)

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JWP 4/22 1784-1785 Letters from [W B] Kirwan, chemist, regarding phlogiston in metals. (3 documents)

JWP W/8 1784-1787 Letters from James Watt junior on his schoolboy travels in Europe: "...We left Dover this morning about 5 o'clock and arrived here by 10, the wind being due North, the Sea was very turbulent, and my stomach was not much better, for I was very sick at intervals during the whole voyage, as was also the Count Andreani...If the rest of France is like this town (Calais) I cannot say I shall be very fond of it, for I think this is the dullest place I ever was in, nobody scarcely stirring in the streets except a few old women with earrings either brass or gilt depending from their ears like the inhabitants of Otaheite...Both the Count and Mr de St Fond disclaim against the English way of living, saying 'no good Roast Beef, no good potatoes' etc, however for my part I think they far excel us in luxury, bringing such medleys to the table as it is impossible to discover the ingredients of and which are very disagreeable to the taste..." (45 documents)

JWP 4/67 1784-1789 Letters from various foreign correspondents, mostly in French concerning James Watt junior's travels. Correspondents include M. Guyot, M. Jeanson, M. Duval, M. Reveillon, M. De Lessart, M. De Virley, M. Sylvestre. (21 documents)

JWP 4/37 1784-1802 Letters from J A de Luc, in French, written from Windsor, when de Luc was reader to the Queen. (38 documents)

JWP C1/12 1785 Letter to Josiah Wedgwood, informing him of a meeting of the Lunar Society, and inviting Wedgwood to stay: "...On Monday next we have a philosophical meeting at Doctor Witherings where all our society will be very happy to see you and I beg of you to come and that you will be so kind as to take a bed at my house. We dine at 2 o'clock and do not part till 8 in the evening." (1 document)

JWP 4/14 1785-1789 Letters from Aimé Argand in English, written from London and Paris, mostly about Argand lamps made at Soho and about water companies in Paris, eg "Since I wrote to M. Rey the letter he has communicated to you, I could hardly find a moment to sit down and write to any of my friends so busy I was in running here and there to Versailles, to different country houses, visiting the Ministers, Intendants and all their alentours. Shewing the lamps to all the Nobility, I think indeed, of the whole Court and Paris, being plagued day and night with visits and tired to death; and lastly, what was no small trouble, obliged as I have been to alter all the lamps I had with me from Soho, many of them plated, brass and tin running from bad solder; and none able to burn from the level of oil being ½ an inch too low..." (19 documents)

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JWP 4/63 1786-1796 Letters from Margaret Miller, Gregory Watt and Jessie Watt. (23 documents)

JWP C1/11 1787 Letter to Josiah Wedgwood, seeking his views on the establishment of a General Chamber of Manufacturers being a plan to bring together the Chamber at Manchester, the Iron Works of Sheffield, the Pottery, Nottingham etc. [Almost certainly this letter was amongst those returned by Thomas Wedgwood to James Watt junior in 1847; see JWP 6/36, Reel 15] (1 document)

JWP 4/35 1787-1789 Letters from Dr Jonathan Stokes (re a watch) and Zaccheus Walker. (5 documents)

JWP W/11 1787-1790 Letters, mostly from Claude-Louis Berthollet, in French, with references to the progress of the French Revolution; other correspondents include the Chevalier Lindriani and M. Brunelle. (21 documents)

JWP W/7 1787-1790 Letters from James Watt junior and his employers, Messrs Taylor & Maxwell of Manchester, mainly concerning business. (58 documents)

JWP 4/2 1787-1790 Letters from C Matthews. [This is probably Mrs Charlotte Matthews, wife of William Matthews (d.1792) who was the London banker of Boulton and Watt; letter number 21 here includes a copy of permission to Boulton to assign engine patents to W Matthews] (40 documents)

JWP C1/8 1788 Letter from Josiah Wedgwood about business matters and the latter's support for the abolition of slavery: "...I take it for granted that you and I are on the same side of the question respecting the slave trade. I have joined my brethren here in a petition from the pottery for abolition of it, as I do not like a half measure in this black business." (1 document)

JWP 4/64 1788-1789 Letters from various correspondents, including Charles Clagget: "It is impossible in London to trust a mechanic with any experiment in the musical way as the great shops will bribe so high to robb any man of his inventions, but I venture to suppose you may find men to be relyed on... Are there any French Horn makers in Birmingham? If not I must bring some with me..." (9 documents)

JWP 4/28 1788-1790 Letters from Mr de Boffe of London, dealer in continental scientific books and Hugh Warden, a Dublin merchant. (10 documents)

JWP 6/25 1788-1790 Letters from Thomas Henry of Manchester concerning experiments with chemical bleaching, infringement of his patents, personal news etc. (8 documents)

JWP 4/13 1790-1792 Letters from various correspondents, including C Addison, A Brown, J Call, William Chapman, D Coke, David Dale, A De Luc, R Fraser, Samuel Galton junior, Samuel Garbett, C Glover, Logan Henderson, R Morhall, Count Reden, J Roberts, Dr John Roebuck, John Roebuck junior, John Scale, John Skeys (re windmills), Hugh Warden, Dr Patrick Wilson, J Woodmason and Samuel Wyatt. Also includes printed leaflet about Birmingham resolutions on the slave trade and the resolutions of a meeting about Ljuneberg's books. (39 documents)

REEL 20

JWP W/6 1790-1794 Letters from James Watt junior on his travels in Europe; a very fine series. (75 documents)

JWP C1/18 1791 Letter from Dr Joseph Priestley inviting Watt to join the Warwickshire Constitutional Society, 27 June 1791, enclosing a printed list of the 'principles' of the society. (1 document)

JWP C1/20 1791 Draft letter from Watt to Dr Joseph Priestley, replying to C1/18 (previous document), explaining why he would not join the society, and expressing doubts about the wisdom of "stirring up effervescence"; written just six days before the Birmingham Riots. (1 document)

Both the preceding letters must have originally been in JWP W/13 (next). Priestley denied that the Lunar Society was ever

involved in political matters, but this letter shows that he corresponded with Lunar members about politics.

JWP W/13 1791-1793 Letters, mostly from Joseph Priestley concerning the Lunar Society, phlogiston, inflammable air, a paper for the Royal Society and other important matters. There is also a draft letter from Watt to Priestley about the riots, counselling caution if Priestley returns to Birmingham: "I have been informed that you intend to come here soon to take leave of you congregation, there is no saying how the populace may act, that they have not forgiven the man they have injured is to be presumed from the general conduct of bad men. I therefore have some fears for you, at the same time it is certain that a cool courage frequently overawes those most determined to do mischief, let me however recommend caution and a proper regard to your own safety; if, therefore, you should find upon coming to Birmingham that ill minded people are likely to excite tumult, a public meeting with your congregation had better be deferred... until time has softened the antipathy with which the ignorant and brutal now regard you"; Watt also mentions having one book from Priestley's library ("I wish I had more"); in November 1791 Priestley thanks Boulton & Watt for the gift of a copying machine and writes of the difficulty of appraising his loss; in March 1792 he writes from America to thank them and other Lunar friends for further gifts of apparatus. This bundle also contains letters from Lorenz Crell of Helmstadt regarding chemistry and from Richard Walker. (13 documents)

JWP C1/33 1792 Letter from his son, James Watt junior, giving news from Paris, 22 March 1792. (1 document)

James Watt junior had formed close friendships with people of radical political views during his years in Manchester. In 1792 he visited Paris with Thomas Cooper (who later emigrated to America with Priestley) to present a letter of congratulation from the Manchester Constitutional Society to the Club des Jacobins, and was consequently denounced in Parliament by Burke. He eventually became disillusioned with the Revolution and returned to England in some trepidation for fear that the government might proceed against him.

JWP 6/23 1792-1794 Letters from various correspondents, including James Miller, Aimé Argand, Matthew Boulton, Charles Clagget (enclosing a printed handbill for his Auton, a mechanical organ in his musical museum in London), J A De Luc. (49 documents)

JWP 4/66 1793-1794 Letters from various correspondents, including Dr Priestley, (sending a Russian vocabulary; asking Watt to make an ink suitable for laboratory labels), William Sabatier, Dr Patrick Wilson, W Craig, John Rennie (regarding steam salt pans), Dr James Lind (regarding Boulton & Watt v Bull), T Byerley, M. Guyot, James Miller, James Keir, Robert Muirhead, Dr Jackson and Mr de Boffe. (41 documents)

JWP 6/32 1793-1799 Letters from his son, Gregory Watt, including one letter from school with a drawing for dissecting a frog, and letters about a visit to Cornwall, a riding accident, a record of the weather, visits to Glasgow and north Wales. (23 documents)

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Detailed Listing - Part 2

REEL 21

James Watt, 1736-1819 Personal Correspondence

JWP 3/37 1793-1809 Letters from various correspondents, 1794-96, including Professor Anderson, Matthew Boulton (enthusiastic about the application to business of their two sons, the state of orders, and the progress of the new factory, 1794), Robertson Buchanan, Abbé Celonne, J Cochrane, Rev E Colne, W Craig, A Dalrymple, A Donald, J Edwards, Samuel Galton jnr (regarding the death of Wedgwood), M. Guyot, William Jardine, Chevalier Lindriani, James Miller, Robert Muirhead, T Parker, Dr Roebuck, M Stark, J Thompson, Tom Wedgwood, Ambrose Weston (regarding pneumatics and his ill child), W Wilkinson (regarding Bersham stoppage). Also includes a few copy letters of James Watt junior and miscellaneous extracts, c1808-09, a letter from James Watt to James Watt junior, 1808 describing a radiator for steam heat he used to warm his room at Harpers Hill about 1784-85, and a letter from James Watt junior to Robertson Buchanan of Glasgow, 1809, saying that c1795 Matthew Boulton directed the installation of steam heating for Dr Withering, having begun alterations to his own house at the same time, "[he] resolved to heat all his rooms by steam and put up a boiler for that purpose in one of his cellars. Circumstances occurred to prevent his carrying his intentions into effect, but the subject underwent frequent discussions and the modes for effecting it were amply considered". (61 documents)

JWP C1/22 1794 Letter from Dr Erasmus Darwin about inventions and experiments, 1 September 1794: "...Mr Thomas Wedgwood wrote to me about a scheme of stuffing feather-bed-covers with air instead of hair - he says feathers always stink & wishes to rest on clouds like the Gods and Goddesses which you see sprawling on ceilings. Now could not (seriously) a pillow be made of leather imbued with a solution of elastic gum? - so as not to smell like oil & to hold air, either atmospheric or carbonate? Thus one might carry ones bed about & blow it up at night, - or blow yourself up as you lye on it, like the philosopher: bellows. ...When matter is formed, as suppose between the muscles of any limb, no hectic fever is produced, tho' the abscess may contain a pint - now if this abscess is opened by a knife so as to admit the air to the surface of the wound, the hectic fever comes on in a few hours! This I suppose to be owing to the pus attracting oxygene, as the blood does; and that this oxygene (if the matter be ever absorbed, which is not certain) may produce fever by its stimulus. Hence carbonate hydrogen might be of great service (perhaps) applied to some wounds, and hydrogene to tendencies to gangrene, which might be done by tying a bladder round the ulcer or over it, blowing air under". (1 document)

JWP C1/16 1794 Letter from Thomas Henry, concerning Watt's pneumatic medical apparatus, 28 December 1794. (1 document)

JWP 4/65 1794-1795 Letters from various medical correspondents, including Erasmus Darwin, Thomas Beddoes, Dr Thornton, Dr Percival, James Lind, Dr Hutton, Robert Mylne and Sir Joseph Banks, mostly about the medical uses of gases. Includes draft letters from Watt to Dr Percival: "*Knowing the insufficiency of theory and the incompetence of the human mind to embrace every circumstance of a complicated subject of any kind, I am a great friend to experiment. Even in the simple science of mechanics, I cannot trust to theory, much less in the obscure paths of physiology; let us therefore try our theories by experiment, when one thing does not do, let us try another, until we come to the most apposite, and let the dose and manner of exposition be raised as much as they permit. But all this will avail nothing, without it be done under the direction of experienced physicians...*" and to Sir Joseph Banks: "*Mankind have been long enough occasionally poisoned by the channel of the lungs, let us try if we cannot receive medicines by the same way...*". A letter from Darwin "*If you have any japanned airholders ready made I should be glad of one, as I think it a convenient machine to measure airs with - or indeed to breathe them from*" has a drawing of an airholder linked to a bladder linked to the appalled face of a patient! (35 documents)

JWP 4/23 1794-1796 Letters from doctors (and a few from patients) including Erasmus Darwin, Thomas Beddoes, Dr Ewart, and Dr Thornton, mostly concerning the use of oxygen as a pneumatic medicine and the illness of his daughter, Jessy Watt. Darwin writes in 1795: "*My daughter Emma is better, but has not taken the oxygen so regularly as she ought to have done, owing in part to my absence from home; but I intend to manage it better... She also takes 2 grains of opium a day, so that the oxygene gas is but a part of the process... Now I grow old, and not so well amused in common society, I think writing books an amusement, I wish you would write books, instead of having those confounded headaches, which you complain of!*" (45 documents)

JWP C1/25 1795 Letter from Dr Erasmus Darwin about his experiments to cure lung disorders, 9 July 1795, but also sympathising with him about the difficult progress of Watt's patent litigation: "*...A lawsuit that pays well to the lawyers goes on like a snail creeping up a pole, which slips down again every 2 to 3 inches, as he advances, until he has beslimed the pole all over.*" (1 document)

JWP C1/10 1785 Letter from Josiah Wedgwood, mentioning a visit to Sir Richard Arkwright, 17 September 1785: "*...I have visited Mr Arkwright several times and find him much more conversible than I expected, and he invites me to come and see him as often as I can, though he at present shuns all company as much as possible because it robs him of his time and breaks in upon his plans. And besides, he says he is no company for them, for whilst they are talking to him upon one subject he is thinking upon another, and does not know what they say to him. He is much affected by the ill-usage he receiv'd at the last trial ... and I believe means to prosecute some of the evidences for perjury... I told him you were considering the subject of patents, and you two genius's may probably strike out some new lights together which neither of you might think of separately.*" (1 document)

JWP C1/42 1796 Letter to Dr Joseph Black sending a small pneumatic apparatus, and about his experiments in medical chemistry, 1 June 1796. This letter was published in Robinson & McKie, Partners in Science, 1970. It must come originally from one of the bundles returned by Black's executors; [see JWP 4/12, Part 1, Reel 13 and JWP 4/44, Part 1, Reel 16]. (1 document)

JWP 6/34 1796 Letters from various correspondents, including Sir John Sinclair, J Roebuck junior, A Anderson, Robert Muirhead, Sir John Dalrymple, Ambrose Weston (suggesting sending a copying machine as a gift to the retired barrister, Mr Baldwin, who will '*spy for us among the great luminaries of government*'), Richard Phillips, Peter Ewart, Samuel Galton junior, J Monteith, Robertson Buchanan and H Goodwyn. (33 documents)

JWP 4/34 1796-1797 Letters from his son, James Watt junior, and James Miller. The letters from Watt junior cover the period when the Soho Foundry was under construction and James Watt was (as usual) depressed about the financial implications: "*I...cannot express how much I am mortified at seeing you write in such low spirits. I wish Mr Boulton had been otherwise employed than in drawing such a picture which [is] by no means a fair because it is not a full representation of the state of our concerns. We have paid everything that is due either from B.W. & Sons, or from the foundry, and we now have upwards*"

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of £2000 in Mrs Matthews hands, which will be increased by at least £2000 more in the course of the present month... The great Drafts that have lately been made upon Mrs Matthews were not so much for the foundry as for the current business of BW & Sons, the magnitude of which demands occasionally large Drafts, but I am sure I need not here be at the pains of demonstrating that it will amply repay them... Is not [the capital] well laid out, in establishing our business upon an independent, an extensive, and a permanent footing, which ensures us facility, dispatch, and pleasure in the execution of our business, instead of carrying it on in that constant state of trouble, anxiety, hurry and dependance which has been the case for the last two years?" (36 documents).

REEL 22

JWP W/9 1796-1798 Bundle of letters from various correspondents labelled 'Doctors 1796-98'. Correspondents include Thomas Beddoes (25 letters, including some about building a scientific theatre in Bristol), Erasmus Darwin: "*I have received a most severe pang from hearing both from Mrs Galton and Mr Keir of your second great misfortune in the loss of your daughter at Glasgow. Life is a forced state! I am surprized that we live, rather than that our friends die... What is there in the world to excite men of the age, at which you and myself are arrived at, to make us wish to continue in it?... Activity of mind is the only circumstance which can prevent one thinking over disagreeable events, which already exist, or are likely soon to exist... Activity does not always produce pleasure, but I think it always prevents or lessens present pain; it is therefore perhaps the only resource which a philosopher can fly to in the hour of affliction...*", Dr Pearson (about Darwin's Zoonomia), Thomas Creaser, Dr Cleghorn, Miles Partington, T Cavallo, T Seward, R Udney, James Lind. (53 documents)

JWP 4/42 1796-1801 Letters from Robert and Gilbert Hamilton, conveying family news. (46 documents)

JWP C1/37 1797 Letter from Frederick Accum, asking Watt to subscribe to a scientific book, 20 January 1797. (1 document)

JWP C1/23 1797 Letter from Dr Thomas Garnett, suggesting that he should hold some philosophical lectures in Birmingham, with printed proposals for the lectures on the back, 24 July 1797. (1 document)

JWP 6/30 1797-1798 Letters from various correspondents, including B Roebuck (about rubber), Sir Joseph Banks (regarding Lisbon lamp glass), Robert Mylne, Sir John Dalrymple (re waterproof cloth), Robert Muirhead, James Keir, Dr Patrick Wilson, T Williams, T Barnes, Ambrose Weston, J Roebuck jnr, Samuel Galton jnr, Josiah Wedgwood II (regarding destruction of smoke) and J P Dearman. (26 documents)

JWP 4/29 1798 Letters from various correspondents, including Matthew Boulton (regarding Land Tax), Sir Joseph Banks (accepting a paper for Philosophical Transactions), John Roebuck jnr, John Rennie (regarding a map of the Clyde), William Stark (about an instrument of drawing perspective, with sketch), Robert Mylne, Patrick Wilson (printed prospectus for engraving on glass; copper engraving), Samuel Galton jnr, James Keir. (33 documents)

JWP 4/30 1798-1799 Letters from his son James Watt junior; topics mentioned include the death of Dr Withering, M R Boulton, Cornish interests. (21 documents)

JWP 6/35 1799 Letters from various correspondents, including Josiah Wedgwood II, Dr Thomas Beddoes, Dr G S Gibbes, Samuel Galton jnr, Ambrose Weston, Robert Mylne, Dr James Lind (regarding the outcome of the Hornblower case and patent locks), Tom Wedgwood: "*I have just quitted Bath after having tried the Waters without any sensible benefit for five weeks, the setting in of the winter has renewed my sufferings, and I find I shall be obliged either to migrate to some warmer country or to shut myself up in a stoved room; I prefer the latter, and shall be exceedingly obliged to you for any information as to the best construction of a brick stove for a room about 15 feet square and 9 high; and also as the proper distance between double windows... I mean to supply the room with warm air to obviate the want of circulation which would ensue from using a stove alone; Beddoes proposes that I should supply it with warm oxygen; I shall probably continue in this room four or five months confining my excursions to a room or two in the house.*", J Roebuck jnr, Matthew Boulton (urging Watt not to begin further actions over their patents following final success in the Hornblower case: "*I think we should confine our contentions to the recovery of our debts, and in that be just, moderate and honourable, for sweet is the bread of contentment...*"), Alexander Black, William Henry, Sir Joseph Banks (who had called together Cavendish and other eminent friends to see Mr Stephenson's toughened glass, which shattered), J Lawson, C L Berthollet and Thomas Wilson. (46 documents)

REEL 23

JWP 6/24 1799-1800 Letters from various correspondents, including Josiah Wedgwood II: "*...I am improving the house at Gunville by building offices to it, and altering the 3rd story from Garrets to Attics, and building stables. I hope to complete the whole before Christmas. I have not employed any architect or builder by contract, but a workman in the village who has just finished a very capital parsonage house remarkably well. I burn my own lime and fall my own timber, buying some however for beams. The old buildings I have pulled down have furnished nearly as much bricks, stone and flints as I want...*", William Mitchell, Erasmus Darwin, A Lee, W Handy, A Weston, Professor Copeland, A Braine, J Lane, Dr Robertson, J Edwards, Matthew Boulton, John Scale, Comte de Thiville, R Young and W Stone. (37 documents)

JWP 6/43 1800-1801 Letters from his son, Gregory Watt, while touring Germany, Switzerland and France. (22 documents)

JWP 6/29 1800-1801 Letters from his son, James Watt junior, regarding personal and business matters, including the Hornblower case. (26 documents)

JWP C1/21 1801 Letter from Humphrey Davy, describing his experiments with electricity, 8 January 1801. (1 document)

Gregory Watt lodged with the Davys while attempting to improve his health in Cornwall, and his letter of recommendation to Dr Beddoes for their son Humphrey provided his first scientific employment.

JWP 6/33 1801 Letters from various correspondents, including Joseph Priestley (thanking Boulton and Watt for the gift of a furnace and pneumatic apparatus), C L Berthollet, Thomas Telford (regarding the London Bridge scheme), James Keir, John Rennie (regarding London Bridge), William Bedford, Professor Playfair, James Walkinshaw of Greenock, William Withering jnr, John Foulds, John Morris, J Lloyd, Humphrey Davy: "*...I wish there was a specific known against erisipelas; not only for your sake but for the sake of other sufferers. It has been latterly a very common disease in this city [Bristol]; & the modes of treatment are not [so] numerous as the physicians who employ them...*", Dr Thomas Beddoes, Robert Livingstone of New York (sponsor of Fulton's experiments in steam navigation), Chevalier Landriani, Samuel Galton jnr, Robert Mylne, John Curtis, Ambrose Weston, Matthew Boulton and J Roebuck jnr. (70 documents)

JWP C2/12 1802 Letters, mostly between James Watt and his son Gregory, but also including letters from Dr Beddoes about Gregory's health, and letters from James Watt junior and J F Tuffen. (51 documents)

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REEL 24

JWP 4/27 1802-1803 Letters from various correspondents, mainly concerning James Watt's visit to France and Germany. Includes letters from Matthew Boulton (regarding his coining machine), William Sabatier, Sir William Beechey (regarding last payment for a portrait), Aimé Argand, Thomas Telford, (regarding the Caledonian Canal), William Withering jnr, Dr Thomas Beddoes, James Keir (regarding the death of Dr Darwin) and R W Darwin (about the same). (79 documents)

JWP 6/31 1803 Letters from his sons, James Watt junior and Gregory Watt, concerning family news, the bankruptcy of a chemist in Manchester, the Birmingham Volunteers, estate business, the disastrous explosion of Trevithick's engine at Greenwich and bankruptcies at Glasgow. (14 documents)

JWP 6/18 1803 Letters from various correspondents including William Withering jnr, William Irvine, Josiah Wedgwood II, Sir Joseph Banks (regarding Roebuck's memoir on gunpowder; see JWP 6/45, Part 2, Reel 38), Sir John Dalrymple, Samuel Galton jnr, Dr Thomas Beddoes (giving news of Richard Lovell Edgeworth and Gregory's health), Birmingham Canal Co., J Gemmill, General Androssi, W Seymour, E S Hutton, G de Trappe, W Wilkinson, Chevalier Landriani, Matthew Boulton, Samuel Garbett, J P Dearman, Mr Fullarton. (65 documents)

JWP 4/61 1803-1804 Letters from various correspondents about Watt's wish to be excused serving as sheriff of Staffordshire, and urging his ineligibility as a dissenter; also letters about Captain Hubbard's patent for a ropemaking machine. (29 documents)

REEL 25

JWP 4/8 1804 Letters and bills from physicians concerning Gregory Watt's health, including letters from Dr Thomas Beddoes, and a retained copy letter from Watt to Beddoes. (36 documents)

JWP 4/45 1804 Letters from various correspondents, including Samuel Galton jnr, William Withering jnr, Sir Joseph Banks (regarding shrievalty), John Rennie (with a profile of seal), Dr Patrick Wilson, Ambrose Weston. (53 documents)

JWP 4/71 1804 Letters, mostly from James Watt junior, Matthew Boulton and John Woodward, in a bundle labelled "Firm". The letters concern business affairs; those from Woodward refer to mirrors and glasses. (64 documents)

JWP 4/6 1804 Letters from various Scottish correspondents, including Gilbert Hamilton, Robert Hamilton, Robert Muirhead, James Miller and N Wilson; mainly family and personal news. (27 documents)

This seems to be the earliest year in which Watt's letters have been arranged by category of correspondent, the usual division being Scottish letters, Firm (ie Boulton & Watt) letters, and Miscellaneous letters.

JWP 6/41 1804-1806 Letters to James Watt and James Watt junior, mostly concerning the death of Gregory Watt, including letters from Francis Jeffrey and Thomas Jackson, with an epitaph drafted by James Watt. (14 documents)

JWP 4/72 1805 Letters, mostly from James Watt junior and Matthew Boulton in a bundle labelled 'Firm', regarding business affairs. (36 documents)

REEL 26

JWP 4/54 1805 Letters from various Scottish correspondents including Robert Muirhead, Henderson, J Playfair, J Robison jnr and Mrs Robison (both about the death of Robison snr). (35 documents)

JWP 6/20 1805-1806 Letters from various correspondents, including J Walkinshaw, G De Trappe, J A De Luc, H Sullis, Sir William Beechey, J F Tuffin, W Davies, Dr R W Darwin, Dr Beddoes, J Barr, J Houghton, W Pritchard, J Stuart, Lord Dundas, W Campbell, W Lawley, Dr Patrick Wilson, A Weston, W Wilkinson, Samuel Garbett, Samuel Galton jnr (regarding canal business), T Hutton, T Lee, William Irvine and John Rennie. (59 documents)

JWP C1/6 1806 Letter from Dr William Taylor, Principle of the College, Glasgow, conferring on Watt the degree of Doctor of Laws. (1 document)

JWP 4/85 1806-1807 Letters from various correspondents, including Dr Thomas Beddoes (8 letters): "*Could not an artificial leech be made...*" and "*I do not know whether you have had the same alarm from mad dogs as we have. I do not think ours was false of excessive - I have seen several animals in a state of violent and fatal disease after the bite of a suspected dog ... In my opinion our medical police wants reformation. But I do not see on what grounds an order for the long confinements of dogs shall be given out and enforced...*", Thomas Telford, John Rennie, William Withering jnr (7 letters), and Ambrose Weston (Watt's attorney): "*Being employed to settle a Specification relating to a Chemical Discovery, I am unable, through my profound ignorance, to proceed a single step...Therefore I must call upon Hercules to help me - I say Hercules, because I presume it must have been by chemistry that he cleansed the Augean Stable, for I cannot suppose so great a Hero was employed in the ungentlemanly process of removing Dung by a Pitchfork*". (105 documents)

REEL 27

JWP C6/6 1806-1808 Letters from various Scottish correspondents, including Robert Muirhead, Professor John Young, James Reddie, Gilbert Hamilton, Robert Hamilton, James Miller and Professor Mylne. (92 documents)

JWP 4/86 1808-1809 Letters from various correspondents, including William Murdock, William Bullock, John Rennie (regarding Northfleet Dockyard) and Penry Price (offering to sell Watt his remaining land in Brecknock and Radnorshire). (121 documents)

REEL 28

JWP 6/51 1809 Letter from William Maclure of Philadelphia, regarding the minerals of the United States. (1 document)

JWP C6/7 1809-1812 Letters from various Scottish correspondents, including Robert Muirhead, James Miller, Robert and Gilbert Hamilton, Archibald Hamilton, Dr T Brown, Margaret Miller, concerning financial, family and local news. Also includes Professor George Jardine about a prize essay and Hunterian stove, Professor Mickleham about the Hunterian heating, and letters regarding the Sir John Moore monument. (117 documents)

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JWP C6/1 1810-1811 Letters from various correspondents including Ambrose Weston, Samuel Galton jnr, Robert Muirhead, R L Edgeworth (regarding scheme for a cast iron tunnel across the Menai Straits: "*My scheme is to join the parts of my fourteen foot cast iron cylinder in one curve in a dry dock opening into the Menai - when the joints were sufficiently secured the whole, let the length be what it might, would float, when both its mouths were above water. When properly ballasted I would open the gates of the Dock, tow the tunnel into the river near the junction of the opposing tides and sink it upon a bed, previously constructed by large stones thrown into the water so as to form two walls 16 feet a sunder filled with sand thrown between them...*"), Cadell & Davies (wanting material for 'short biographical notes'), Maria Edgeworth (describing the church spire her father had constructed: "... *If you should see a puffing paragraph in the newspapers about my father's spire 'challenging the three kingdoms and all Ireland to equal such and invention' I trust you will believe that we have too much commonsense and a little too good taste to have, in the language of this county, any art or part in the said preposterous paragraph*") G Bullock, Sir Thomas Lawrence, C L Berthollet, Professor Jardine. (103 documents)

REEL 29

JWP C6/2 1812-1813 Letters from miscellaneous correspondents including James Lawson, Sir Thomas Lawrence, James Weston, Sir Joseph Banks, John Rennie, George Fox, Richard Lovell Edgeworth: "*I have always thought that steam would become the universal lord and that we should in time scorn post horses. An iron railroad would be a cheaper thing than a road on the common construction... I do not know how your steam engine acts against the water; the common method is to employ circulating oars or paddles. An ingenious workman in my neighbourhood constructed a reacting pump to force the boat forward as in the manner of Barker's Mill. It acts well and he proposed it for a steam boat: but here nobody would listen to him...*", Joseph Townsend, J F Tuffen. (133 documents)

JWP C6/8 1813-1817 Letters from various Scottish correspondents. (154 documents)

REEL 30

JWP C6/3 1814-1815 Letters from miscellaneous correspondents including J Chantrey, Dr Swediaur of Paris: "*I hope I shall now from time to time get news of my friends in England, which we have been deprived of these last years, it being reckoned nearly criminal to keep on any correspondence, however innocent, with England. Our new masters are milder, but I am afraid will not go on upon any better principles: what is given with one hand is taken away with the other, as you will plainly see with regard to the liberty of the press; this principle being the only firm foundation for good and reasonable government, & now being withdrawn, or modified as they say here for two years, or as I believe for an indefinite number of years. We have no claim on individual liberty, not any guarantee against the most aggressive taxes or any other exertion of tyranny, because you have no right to complain...*" G H Turner: "*Very late last night, I learnt the Emperor of Russia is to be at our Rope Manufactory this morning Saturday; and if you and Mrs Watt can get so far, I shall be most glad to see you...*", Sir Joseph Banks, Dr David Brewster (regarding the publication of Watt's corrections to Robison's book on steam). (129 documents)

JWP 6/53 1815-1819 Letters from John Murray setting out his agreement to publish Robison's essay on steam with Watt's corrections, and from John Murdock about his father's steam carriage. Also, an inventory of Mrs Watt's estate papers. (3 documents)

JWP C6/4 1816-1817 Letters from miscellaneous correspondents including Dr David Brewster, John Rennie, Frankland Lewis MP and many others. (138 documents)

REEL 31

JWP C6/5 1818-1819 Letters from various correspondents. (105 documents)

JWP C6/9 1818-1819 Letters from various Scottish correspondents. (77 documents)

JWP C6/10 1819-1820 Letters, notes and some printed items and extracts containing biographical material about James Watt, including letters from Sir William Playfair, John Rennie, Maria Edgeworth, Dr Brewster, Mrs Sophia Lee, and correspondence with Macvey Napier and Francis Jeffrey regarding a biographical memoir of Watt for a supplement to the Encyclopaedia Britannica, to be written by Watt junior who insists on anonymity. (1 bundle)

REEL 32

James Watt, 1736-1819 Diaries, account books, memoranda books etc

JWP 3/21 1757-1764 Accounts of household and personal expenses. Mostly personal accounts for clothing, journeys etc, but also some payments for his shop. (1 volume)

JWP W/14 (1765)-1814 Notebook describing Watt's experiments on copal varnish, latent heat etc. This is the octavo notebook of experiments published in full in *Partners in Science*, pp 425-489, with twelve plates including the famous kettle sketch. The manuscript dates mainly of 1783, the year that Watt repeated his experiments of 1765 on latent heat. The earlier experiments on copal varnish etc are described retrospectively, but the 1783 experiments on latent heat are recorded here as they were performed (with various revisions, pasted cancels, etc); this is the only original laboratory notebook in the collection. The full range of dates mentioned is 1765-1814, but the earlier dates are retrospective, and 1814 refers to two leaves pasted in after f.45; most of the manuscript must date from c1783. (1 volume)

JWP 4/55 1773-1775 Sundry accounts and receipts. (20 documents)

The series of volumes described below covers the years 1776-1785. It is worth noting that earlier ones, 1768-1774, and later ones, 1786-1787, are in the Boulton & Watt Collection (Please see Muirhead I material already filmed by Adam Matthew Publications in Series One of this microfilm project; see especially Reels 17 and 18 of Series One: B&W MI/1/14-21, MI/2/17). Although these notebooks form a single chronological series, they are of two distinct types; the printed pocket diaries which are basically appointment books, and the small octavo journals containing extended notes. It may be that Watt at least at some periods kept one of each for each year. The journals are especially valuable as one of the few sources of information about the date of Lunar Society meetings.

JWP C3/1 1776 This comprises Cumming's Gentleman's Useful Memorandum Book for 1775, used by James Watt as a diary and account book in 1776. Includes appointments, a few memoranda (July: "*was married to Miss A McG.*"), and a few notes of expenditure. Lightly used, but used throughout. (1 volume)

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JWP C3/2 1777 The New Daily Journal or Complete Account Book, used by James Watt as a diary and account book. Includes appointments and a few notes of expenditure. (1 volume)

JWP C3/3 1778 Small manuscript journal including details of engines etc. (1 volume)

JWP C3/4 1779 Small octavo journal, 4 January-2 July 1779. Mentions Perrier and Paris water supply; drawings for Poldice steam pipe; records drawings made and letters written; his health; visitors (Wilkinson, Darwin etc) at Soho; report on leaks in engine and how repaired; experiments with copying machine. (1 volume)

JWP C3/5 1779-1780 Small octavo journal, 4 July 1779-1 May 1780. Similar to the previous journal, it records visits to Poldice, Tingtang, Truro; letter to Dr Black etc. (1 volume)

JWP C3/6 1780-1785 Diary. Small octavo volume, with irregular entries, including a trip to London and to the engine at Hawkesbury Colliery. (1 volume)

JWP C3/10 1782-1812 Commonplace book. A thick folio notebook bound in vellum, containing notes from printed books, eg on experiments by Lavoisier and de la Place, also Watt's account of his own experiments on heat, and on experiments by Priestley. (1 volume)

JWP C3/7 1783 The Warwickshire, Staffordshire and Worcestershire complete pocket companion and annual account book, used by James Watt as a diary and account book. Includes appointments and a few note of expenditure. (1 volume)

JWP C3/8 1784 The complete pocket-book or gentleman's and tradesman's daily journal, used by James Watt as a diary and account book. Includes appointments and a few notes of expenditure. (1 volume)

REEL 33

JWP C3/9 1785 The complete pocket-book or gentleman's and tradesman's daily journal, used by James Watt as a diary and account book. Includes appointments and a few notes of expenditure. (1 volume)

JWP 3/56 1786-1787 Account Book for James Watt's expenses during a business trip to Paris with Matthew Boulton, November 1786-January 1787. (1 volume)

JWP 3/53 1806-1817 Bundle of miscellaneous receipts and letters. (1 bundle)

James Watt, 1736-1819 Business records: instrument making

JWP C4/B33 nd [c1775] Notes on 'dailing and making instruments'. (1 volume)

JWP C1/1 1759-1765 Account book as mathematical instrument maker at Glasgow. Includes an inventory of tools, goods etc, belonging to James Watt and John Craig, 1759. (1 volume)

JWP 3/41 1761-1770 Miscellaneous accounts, invoices and letters, most relating to mathematical and musical instruments, jewellery and general merchandise. (26 documents)

JWP 4/58 1763-1766 Miscellaneous accounts. (21 documents)

JWP 6/28 1763-1773 Miscellaneous letters and accounts for goods sold by James Watt, annotated with many notes such as 'never paid', 'bankrupt and lost' etc; also includes accounts regarding surveying work, London journeys etc. (102 documents)

JWP 4/46 1765-1769 Miscellaneous accounts, apparently for the instrument business. (33 documents)

JWP 3/40 1766 Miscellaneous accounts and papers concerning merchandise for the shop, including invoices from Startin & Moody of Birmingham and Christopher Stedman of London. (25 documents)

JWP C1/5 1767 Account with Messrs Startin & Moody of Birmingham for supply of scientific instruments to Watt, 26 September 1767. (1 document)

This early account from a Birmingham firm to Watt shows that he was in touch with Birmingham manufactures well before he met Boulton and had enlisted his aid in the development of the steam engine. Besides scientific instruments, he sold a variety of small Birmingham metal wares in his Glasgow shop.

JWP C1/9 1767 Account with John Wyke of Liverpool for supply of vices, cutting nippers etc, 5 December 1767. (1 document)

This account shows Watt in touch with Wyke, who was later to make engine counters for Boulton & Watt, in the years before he developed his engine; in fact Watt's journal shows the two men were in contact as early as 1760 (see Musson & Robinson, p. 437).

JWP C1/7 nd [c1770] A catalogue of philosophical, optical and mathematical instruments made and sold by Benjamin Martin with handwritten additions of sums of money under heading 'profits allowed'. (1 volume)

James Watt, 1736-1819 Business records: surveying

JWP C4/B27 nd [c1755] Notes on 'surveying of land'. (1 volume)

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JWP 3/23 1768 Printed report of John Golborne relative to the deepening of the river Clyde and the harbour of Port Glasgow, November 1768. (7 pages)

JWP 3/71 1770 Reports regarding the construction of canals, signed by Watt. (3 pages)

JWP 3/43 1770 Specification, reports, accounts and letters concerning the construction of piers, arches etc for Hamilton Bridge. (1 bundle)

JWP 3/39 1770-1773 Papers concerning Ayr harbour, canal and road construction. (4 documents)

JWP 3/22 1772-1774 Report by James Watt for HM Commissioners for managing the annexed estates in Scotland concerning the isthmuses of Tarbert and Crinan, with a scheme for rendering navigable the Rivers Forth and Devon, with estimates. (95 pages)

JWP 3/45 1773 Surveying of the rivers Forth and Devon by James Watt, including tables, estimates, and statements of Watt's expenses. with Lord Cathcart's notes and remarks on the report. (1 volume)

JWP 3/69 1773-1774 Reports and surveys by James Watt on the construction of canals, with nice incidental details on the local economy etc. (1 volume)

JWP 3/57 1774 Extracts from the minutes of the committee for building Rutherglen Bridge. (3 documents)

James Watt, 1736-1819 Business records: steam engines

JWP JW/1 1698-1784 Copy specifications of various inventions from that granted to Thomas Savery in 1698 to that granted to Robert Cameron in 1784, compiled no doubt in relation to one of Watt's patent applications. (1 volume)

JWP 4/52 1766 Papers and drawings concerning the Carron Company fire engine. (10 documents)

JWP 3/19 1767-1796 Volume of miscellaneous collections relating to James Watt's steam engine and patents. Includes printed acts concerning patent law; Watt's patents and other for engraving, cement etc; Mr Weston's memorial concerning patents, 1785; a printed copy of the 1775 act, [1794]; a pamphlet entitled An account of James Watt's Improvement upon the steam or Fire Engine, nd; Mr Watt's specification of his Method of lessening the Consumption of Steam and Fuel in Fire Engines, nd [printed]; and a copy of the decision in Boulton v Bull. (1 volume)

JWP C1/35 1769 Note on the particulars of a steam wheel, with a small diagram. (1 document)

This invention is in essence a steam turbine, and therefor of great interest to the historian of steam power. John Wilkinson, the iron founder, was asked to make such a wheel, but the practical difficulties of execution obliged Boulton and Watt to concentrate their energies upon their improvements to the Newcomen engine.

JWP G/2 1776-1794 Volume containing various Acts of Parliament relating to the inventions of manufacturers, including the 1794 printing of Watt's 1774 patent, and others regarding ship rigging, cement etc. (1 volume)

JWP 3/1 1781-1784 Manuscript copies of Mr Watt's specifications of his inventions of several mechanical improvements to the steam engine. [These are the patent specifications of the 1781, 1782 and 1784 patents.] (1 volume)

JWP C1/43 1781-1786 Folder of drawings regarding specifications. Uncoloured drafts for some of the patent specifications. (1 folder)

JWP G/14 1781-1782 Original patent granted to James Watt for improvements to the steam engine, February 1782, (known as the 1781 patent, because the application was filed in that year) with original specifications and drawings signed by Watt. (1 document)

JWP G/12 1782 Original patent granted to James Watt for improvements to the steam engine. The patent was granted 12 March and specification supplied 3 July. Signed by Watt and endorsed with a note of enrollment. (1 document)

JWP 4/1 (1782) Printed copy of the specification for the 1782 patent, printed in 1798. (1 document)

JWP 4/5 1783 Draft of case for counsel in Boulton & Watt v Hornblower. This would appear to relate to an action that was not proceeded with; it is thirteen years earlier than proceedings which were finally brought against Hornblower for breach of the Boulton & Watt patents. (1 volume)

JWP G/13 1784 Original patent granted to James Watt for new improvements to fire and steam engines, with the specification drawings signed by Watt, patent stamps etc. (1 document)

JWP 3/32 1784-1787 Papers relating to James Watt's specification, including a copy of the 1782 specification, several drafts of the 1784 specification; draft specification for the furnace patent of 1785. (1 bundle)

REEL 35

JWP G/15 1785 Copies of the specifications for Watt's patents from 1775-1785, with the related drawings; also a transcript of the proceedings of the parliamentary committee for the patent extension, 1775, and patent for a smokeless furnace. (1 volume)

JWP G/1 nd [c1786] Drawings on parchment of sections of the new steam engine, labelled 'Drawing of Irish specifications'. (1 document)

JWP 3/35 nd Remarks on Mr Watt's specifications of his steam engine, with corrections; there is also material on the Bull Trial (1793/4 ?). (1 document)

JWP 3/20 1786-1794 Extract from letters concerning Boulton & Watt's steam engine, concerns in the county of Cornwall, and memoranda relating to the same subject. (83 pages)

JWP W/2 1788 Directions for erecting and working the newly invented steam engines, Boulton & Watt; with Additional Directions..., undated, with plates numbered X-XV and extensive annotations and corrections to adapt them to a particular unspecified engine in 1788, although the note on the wrapper 'With Mr Poli's drawings, 3-6-88' may provide a clue. (2 documents)

JWP C4/D31 1793-1795 Record of results of experiments with the Boulton & Watt engine at Salford cotton mill between

December 1793 and December 1795. (1 document)

JWP 4/78 1808-1809 Papers concerning the 'Olynthian controversy'. Prompted by J Hornblower's history of steam in Olinthus Gregory's *Mechanics*, including a letter from Watt to Watt junior referring to the blowing valve, parallel motion, and expansive working [published in *James Watt and the Steam Revolution*], and a paper concerning the rival claim of Gainsborough to invention of the separate condenser. (1 bundle)

James Watt, 1736-1819 The steam engine patent extension, 1775

JWP C1/3 nd [c1774] Drawing on parchment of the Double Engine, produced to the Committee of the House of Commons in 1774-1775, also drawing of steam wheel. (1 document)

JWP 4/53 1775 Copy of minutes of a meeting of the Committee on Recommitment of Mr Watt's Engine Bill, 1775. (1 volume)

JWP C1/4 1775 Drawing of engine laid before Parliament in April 1775. (1 document)

James Watt, 1736-1819 Boulton v Bull

JWP G/6 1769-1794 Book no 1, Boulton v Bull; Mr Watt's act of 1774 (1794 printing), specifications of 1782 and 1784 and papers relating thereto. (1 volume)

JWP 3/6 (1781) Book no 2, Boulton v Bull; folding drawings of specifications for the 1781 patent bound into a folder. These drawings from the Bull case are reproduced in colour in *Robinson & Musson, James Watt and the Steam Revolution*. (1 volume)

JWP 3/4 (1782) Book no 3, Boulton v Bull; folding drawings of specifications for the 1781 patent bound into a folder. These drawings from the Bull case are reproduced in colour in *Robinson & Musson, James Watt and the Steam Revolution*. (1 volume)

JWP 3/5 (1784) Book no 4, Boulton v Bull; folding drawings of specifications for the 1781 patent bound into a folder. These drawings from the Bull case are reproduced in colour in *Robinson & Musson, James Watt and the Steam Revolution*. (1 volume)

JWP C4/C4 1798 Single sheet of observations [?by Watt] on Mr Weston's argument. (1 document)

JWP G/7 1792-1794 Book no 5, Boulton v Bull; specifications of steam engine. Includes 'list of patents for steam and fire engines which Boulton and Watt have searched for in the office'; précis of patents (probably related to the collection of patents in JWP 3/30, see below) with occasional comments such as 'piracy', 'this man was in the employ of B&W' etc. (1 volume)

JWP G/8 1792-1794 Book no 6, Boulton v Bull; miscellaneous specifications. A précis of the documents in JWP 3/28. (1 volume)

JWP 3/28 1792-1794 A bundle of specifications of patents collected for use in the case of Boulton & Watt v Bull, with a 'list of patents for new inventions selected with a view to the cause of Boulton & Bull' endorsed by A & J Weston. (1 bundle)

JWP 3/30 1792-1794 A bundle of specifications of patents collected for use in the case of Boulton & Watt v Bull, with a copy letter from James Watt junior to James Weston asking for further copies of patents, 1814, and a reply from Weston sending them. (1 bundle)

The two preceding bundles include many specifications for improvements in the steam engine, including Savory, 1798; J Wise, 1740; H Wood, 1769; W Blakely, 1766; J Stewart, 1767; J Hatley, 1768; J Pickard, 1780; G Matthews, 1781; J Hornblower, 1781; R Cameron, 1784; T Mitchell, 1787; T Head, 1787; A Heslop, 1790; I Mainwaring, 1791; J W Rowe, 1792; T Mead, 1791.

JWP 4/25 nd[c1793] Boulton v Bull; a view of the objections which have been at various times urged against Mr Watt's specifications. Published by Robinson & Musson, James Watt and the Steam Revolution. (1 document)

JWP 4/26 1796 Boulton v Hornblower; answers by Mr Watt to objections made to his specifications, a clerk's copy. (1 document)

JWP 4/31 1796 Boulton v Hornblower; the holograph answers by Mr Watt to objections made to his specifications. (1 document)

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JWP 3/14 1793 Boulton v Bull; copy of the shorthand writer's notes of the trial in the Court of Common Pleas, 22 June 1793. (1 volume)

JWP 4/73 nd [c1794] Papers relating to patents for use in Boulton v Bull, including a letter from A Weston, enclosing a paper on thermometers and a letter from Watt to Weston concerning the John Dolland case. (1 bundle)

JWP G/9 1794 Boulton v Bull; extracts made for Messrs Boulton & Watt for sundry patents for inventions. (1 volume)

JWP 3/7 1794 Boulton v Bull; copy from Mr Gurney's shorthand notes of the argument in the Court of Common Pleas, Mr Serjeant Watson's argument for the plaintiff, 1st argument, 27 June 1794. (1 document)

JWP 3/2 1794 Boulton v Bull; copy from Mr Gurney's shorthand notes of the argument in the Court of Common Pleas, Mr Serjeant Le Blanc's argument for the defence, 1st argument, 28 June 1794. (1 document)

JWP 3/11 1795 Boulton v Bull; copy from Mr Gurney's notes of the argument in the Court of Common Pleas, Mr Serjeant Adair's argument for the plaintiffs, 2nd argument, 31 January 1795. (1 document)

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JWP 3/12 1795 Boulton v Bull; copy from Mr Gurney's shorthand notes of Mr Serjeant William's argument for the defence and Adair's reply, 2nd argument, 3 February 1795. (1 document)

JWP 3/3 1795 Boulton v Bull; copy of Mr Gurney's notes of the arguments of the judges in the Court of Common Pleas, 16 May 1795. This copy of the judges' arguments has some manuscript corrections, and was perhaps used for the publication *The Arguments of the Judges in two causes relating to the letters patent granted to James Watt, of which a copy is in JWP 3/66*. (1 document)

JWP C4/C5 nd[c1795] Appendix to the arguments of the judges in Boulton v Bull. (1 document)

JWP 3/66 1799 The arguments of the Judges in two causes relating to the letters patent granted to James Watt, London, 1799. Enclosed in a wrapper sending the pamphlet from James Watt junior to M Arago in October 1834. (1 document)

James Watt, 1736-1819 Boulton & Watt v Hornblower and Maberly

JWP 6/42 1769-1798 Papers regarding patents used in the Hornblower case, including notes by James Watt on improvements to the steam engine and a copy of the solicitor's bill for getting the 1775 Act through Parliament. (1 bundle)

JWP 4/69 1775-1799 Papers regarding Cornish mines and James Watt's steam engine patent. Mainly concerning the 1775 patent extension and the Hornblower case; about 20 manuscript and 13 printed briefs, including a memorandum of profits and 'Points to be known by a steam engineer', both printed in James Watt and the Steam Revolution. Also includes general papers about patent disputes, 1792-1799. (1 bundle)

JWP G/20 1794-1799 Particulars respecting Messrs Boulton & Watt's connections with sundry mines in the County of Cornwall, with list of adventurers' names etc., compiled in connection with the case against Hornblower. (1 volume)

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JWP 4/38 1795-1796 Letters and testimonials concerning the originality of James Watt's improvements to the steam engine by Dr John Roebuck and others, used in the case against Hornblower and Maberly. (1 bundle)

JWP 3/36 1796 Boulton v Hornblower; Professor Robison's narrative of Mr Watt's invention of the improved engine. (1 document) [Printed in Robinson & Musson, *James Watt and the Steam Revolution*. Written for the Hornblower case this is a vital document in the history of steam; an independent description of Watt's early work and the invention of the separate condenser by one of the first men in whom Watt confided.]

JWP 3/29 1796 Boulton v Hornblower; briefs from the plaintiffs in the Common Pleas and in Chancery, prepared by A J & G Weston, solicitors, and endorsed with the barristers fees. (1 bundle)

JWP 3/9 1796 Boulton v Hornblower; copy of Mr Gurney's shorthand notes of the trial, part 1: plaintiff's case and evidence, 16 December 1796. (1 document)

JWP 3/10 1796 Boulton v Hornblower; copy of Mr Gurney's shorthand notes of the trial, part 2: defence case and evidence. (1 document)

JWP 3/13 1797 Boulton v Hornblower; copy of the shorthand writer's notes of what passed in the Court of Common Pleas in Hilary Term 1791 in relation to the defence's motion for a new trial, 11-13 February 1797. (1 document)

JWP 3/31 1797 Boulton v Hornblower; papers about the alleged insufficiency of the patent, and why there should not be a new trial. (1 bundle)

JWP 3/27 1797 Printed Letter to the Rt Hon Sir James Eyre, Justice of the Common Pleas on the subject of the cause, Boulton & Watt v Hornblower & Maberly, printed for John Stockdale. By Joseph Bramah, witness for the defence in the Hornblower case, contesting the validity of B&W's patent, and claiming he has built engines with cooling applied to the eduction pipe only. In the margin a manuscript note "*Piracy complete and a full proof of our case*". (1 document)

JWP 3/15 1798 Hornblower v Boulton; observations by way of materials for the second argument. (1 volume)

JWP 3/16 1799 Hornblower v Boulton; argument in the King's Bench of Serjeant Le Blanc and judgement of the Court, 25 January 1799. (1 volume)

James Watt, 1736-1819 Business records: copying machine

JWP C1/39 1780 Parchment patent for the copying machine, with an illustration. (1 document)

This machine was a most important contribution by Watt to commercial practice, since before its invention if a copy had to be taken of a letter it had to be done by hand. Watt's machine was quickly put to use (the earliest press-copies in the archive date from 1779), and it remained the most important method of copying letters until the advent of the typewriter in the late 19th century. The principle was that a letter was written in the normal way and then sheets of thin unsized paper were placed in a wetted condition on top of the original document. These sheets and the letter were then passed through a roller which exerted an even pressure so that the ink from the letter is absorbed by the sheets. The copy letter was then read on the reverse side of the sheets. One of the great difficulties facing Watt and his partners was devising a really reliable ink that would penetrate the unsized copy paper at an appropriate and predictable rate.

James Watt, 1736-1819 Miscellaneous papers

JWP 3/64 nd [c1765] Plan of the Duke of Bridgewater's curious weir at Castle Field near Manchester. (1 document)

JWP W/1 1769-1802 Volume of letters to Dr James Lind from Professor Alexander Wilson and his son, Dr Patrick Wilson concerning printing and astronomy matters, including Herschel, a comet, a thermometer, and attempts to interest Mr Watts, printer to the University of Cambridge, in placing an order with Glasgow Letter Foundry. (1 volume of 22 letters)

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JWP C1/19 nd [c1770] A print of globes with prices for globes and other scientific instruments written on the back. (1 document)

JWP C4/B37 nd [c1820] Notebook, mostly unused, but containing some pencil entries and remarks on arsenic etc. (1 volume)

JWP 4/77 1771-1795 Miscellaneous papers including an estimate for constructing a wooden lock. (9 documents)

JWP JW/6 1776 [J Smith] A plan and description of Mr John Stewart's Fire Engine Mill, London, [6], xxviii, 54, plus two plates. Complete copy, plan slightly defective. (1 volume)

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JWP 4/74 1777-1814 Miscellaneous papers regarding engines and M Argand's patent for a lamp, including a list of rotative engines. (5 documents)

JWP C1/41 1782 A catalogue of the philosophical books belonging to Dr Priestley. A most important list, since Priestley's library was destroyed in the Birmingham riots of 1791. Watt mentions this list in a draft of a letter to Priestley (please see JWP W/13, Part 1, Reel 20), but omitted it from the final version (see JWP LB/2, Part 1, Reel 7) either because he could not find it or because he feared it would distress Priestley to be reminded of his loss. This list was used to reconstruct the library for the Lunar exhibition in 1966, and was itself exhibited. (1 document)

JWP C4/C7 1785 Printed pamphlet in a plain cover, entitled in manuscript, 'Southern on aerostation'. (1 volume)

JWP 3/67 nd [c1788] Volume [attributed to Charles Clagget] describing a pattern for improving the finger boards of violins and other instruments, with comments by James Watt. (1 volume)

JWP C4/C18B 1791 Inventory of furniture in each room of James Watt's house [presumably Heathfield Hall]. (1 volume)

JWP C4/C6 1794 Printed rules and regulations of the Engineers Society. (1 document)

JWP 3/50 1795 Plan and measurement of an unidentified house. (1 document)

JWP C1/30 1796 Prospectus of an essay on mechanical geometry by Benjamin Dorne, with a letter from Dr Thomas Beddoes about a patient "...too far gone but willing to try anything". (1 document)

JWP 6/50 1796 List of improvements to the steam engine not secured by patent. (1 document)

JWP 3/65 nd [c1800] Bundle of miscellaneous papers concerning patents and business matters. Includes directions for making preparatory surveys for the Russian Canals; remarks, suggestions and notes on shorthand writing; notes on Esperanto vocabulary; heads of a bill for explaining and amending the laws relative to patents; considerations on the means of securing the manufacturers of Great Britain for the dangers to which they are exposed in consequence of the present... taxation. (1 bundle)

JWP 6/45 1800-1805 Bundle of miscellaneous papers, including financial calculations; Dr Roebuck's memoir on gunpowder, 1803; printed papers regarding canals etc, and 'Some observations upon the Subject of Patents'. (1 bundle)

JWP C4/D22 c1800-1810 Plans of Watt's east Radnorshire estates, including three plans of Kinnerton, with a list of holdings two plans of Stonehouse, two of Llanakiddy, one of Upper Hergest and one of Yr Aber. (1 bundle)

JWP C4/D20 1801 Papers concerning Telford's design for rebuilding London Bridge, including engraved drawings of the proposed design with a 600ft single span; list of questions addressed to Watt by Charles Abbot, chairman of the Committee for the Improvement of the Port of London, with a copy resolution of the committee; letters between Telford and Watt about the bridge design, pencil sketches by Telford of bridge designs and rough draft of Watt's observations to the committee. (1 roll)

JWP 6/54 1802-1803 Bundle of specifications and estimates regarding the steam engines, including letters from Robert Fulton to James Watt junior about the advantages to Great Britain arising from steam engines, 1802; letters and calculations from John Southern about experiments on latent heat and strong steam, 1803; specification and estimate for building a new cow house at Heathfield, 1802. (1 bundle)

JWP G/10 1803 A survey and report of the coasts and central highlands of Scotland... in the autumn of 1802 by Thomas Telford. (1 document)

JWP 3/52 1808 Papers and plans concerning Mr [William] Strutt's stove, proposed for heating the Hunterian Museum, Glasgow, with draft letter from Watt to James Mylne and reply, and a letter from Strutt to Watt. (1 bundle)

JWP 3/54 1808 As per JWP 3/52 above. (1bundle)

JWP C4/D29 1808 Plans and drawings concerning Watt's proposals for revising the heating system of the Hunterian Museum. (7 documents)

JWP C4/D27 1809 Designs by George Bullock for two bowls, male and female classical figures, an ornate clock, and a harp. (4 documents)

JWP C4/D21 1810 Survey of a proposed branch of the Birmingham Canal in the parish of Aston, by John Snape. (1 roll)

JWP 3/59 1812 Copy of petition to Parliament from Samuel Compton regarding his invention for spinning cotton. (1 document)

JWP W/4 1812 Instructions for preparing and using Barton's patent hydrostatic floating lamp. (1 document)

JWP 6/26 1812-1818 Miscellaneous drawings and tracings including lathe drawings, 'movable puppet' [a trussed frame to carry the lathe], drill frame etc. (38 documents)

JWP JW/14 1814 Professor Robison's essays upon steam and the steam engine with Mr Watt's printed notes. These are the unbound sheets of Robison's book, based on articles in the Encyclopaedia Britannica; for correspondence about it with the

publisher, John Murray (see JWP 6/53, Reel 30). (1 bundle)

JWP C4/D23 nd Print of Sir Thomas Lawrence's portrait of Watt. (1 document)

JWP C4/D30 nd Various prints of portraits of Watt, with miscellaneous photographs, 'Hints for engine drivers' etc. (1 bundle)

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James Watt junior, 1769-1848 Press copy letters

JWP LB/7 1794-1804 Private letter book, uniform with his father's letter books. (1 volume)

JWP LB/8 nd [c1800] Private letter book, containing a 19 page letter to Mr Barnes regarding pyrites with illustration, and another, of 5 pages to the same, the rest of the volume is blank. (1 volume)

JWP 6/61 1804-1806 A bundle of press copies of letters. (191 documents)

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JWP 6/62 1807-1808 A bundle of press copies of letters. (221 documents)

JWP 6/63 1808-1815 A bundle of press copies of letters. (298 documents)

JWP 6/64 1815-1816 A bundle of press copies of letters. (176 documents)

JWP 6/65 1809-1817 A bundle of press copies of letters, 1809, 1816-1817; nearly all addressed to Mr Mosley, London agent. (42 documents)

James Watt junior, 1769-1848 Personal correspondence

JWP 6/55 1788-1789 Letters in French and German from various correspondents including J H Pott and C L Berthollet, with translations. Topics discussed include dyeing (Mr Taylor's turkey-red process), process for making sal ammoniac, tin etc. Also includes Boulton's assignment to James Watt of his 'Tyburn ticket', 1789. (5 documents)

JWP C2/10 1800-1804 Letters from his brother, Gregory Watt, giving details of his foreign travels. (25 documents)

JWP C1/24 1802 Letter from Robert Fulton in Paris, requesting information about the use of steam engines in navigation, with a small diagram. (1 document)

The manufacture of steam boat engines became one to the mainstays of Boulton & Watt's business in the 19th century, but the American inventor Robert Fulton was one of the first to interest himself in the steam propulsion of ships; he revolutionised inland waterways transport in the USA. In the 1780s Matthew Boulton had experimented with a small boat driven by a steam engine on Soho Pool, and even earlier in the 1760s there is the amazing suggestion in a letter from James Watt, accompanied by a sketch, that boats might be driven by a screw-propeller worked by steam power.

JWP 3/58 1808 Letter from James Watt junior to Professor Playfair listing papers left with the latter. (1 document)

JWP 3/60 1809 Letter from G A Lee of Manchester about steam heat, January 1809. (1 document)

JWP 4/84 1819 Copy letters and news cuttings concerning the death of his father, James Watt, including letters (many of them addressed to Matthew Robinson Boulton) from John Rennie, S T Galton, Josiah Wedgwood jnr and a list of mourning rings. (1 bundle)

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JWP 3/49 1822 Letters to and from James Watt junior, including a copy letter to Mr Ferrier on the Rhine vessel, and others concerning steam tugs on the Rhine. (8 documents)

JWP 3/42 1822-1823 Letters and documents concerning steam navigation; mainly the claim by William Symington for remuneration for his inventions for propelling canal barges and the experiment of towing the *Rafael*. Contains an important letter from Symington to J A Walker, 1822, describing the development of his ideas from theory to practice, "...*Another larger trial took place in 1789 on the Forth of Clyde near Carron ironworks, amidst hundreds who with loud exclamation hailed us from the banks whilst gliding along the canal*", and the way in which Henry Bell of Glasgow, designer of the "Comet", and Robert Fulton both examined his boat before constructing their own successful steam vessels. (9 documents)

JWP 6/52 1829 Letters from various correspondents in answer to his request for information about Humphry Davy for a biography by Dr Paris who had applied to him for information. Includes a letter from Josiah Wedgwood jnr about Davy and Gregory Watt in Cornwall in 1797-98. (6 documents)

JWP W/10 1833-1839 Letters from various correspondents, with a few copy replies by James Watt junior. Correspondents include Sir Francis Chantrey, W Arago, P Ewart, J B Pentland; most letters concern Arago's Eloge. (68 documents)

JWP 4/83 1834 Letter from James Gibson, sending anecdotes for James Watt to be sent on to Arago. (1 document)

JWP W/12 1834-1837 Letters from W Arago, concerning his Eloge historique de James Watt. (23 documents, numbered 77-100)

Miscellaneous papers

JWP 3/63 [1796]-1848 Current account statement for Messrs Boulton & Watt 1796-1825, with related letters, 1842-48; concerns accounts with A J & G Weston, solicitors, allegedly outstanding for patent lawsuits. (3 documents)

JWP C2/15 1804-1807 Papers relating to will and property of his brother, Gregory Watt. (1 bundle)

JWP JW/2 1809 The Edinburgh Review, no 26, January 1809, containing an article on the steam engine (pp 311-333), with annotations by James Watt junior. (1 document)

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JWP C4/D25 1809-1810 Architectural plans and decoration drawings for Miss Boulton's house at Thornhill, including Bullock & Gandy's design for greenhouse, and sketches for saddle room wall, kitchen dresser, bookcases etc. (13 documents)

JWP C4/C18 nd [c1810] Large plan of Heathfield House grounds with pencil annotations apparently used for landscape design. (1 document)

JWP 3/47 1812-1813 Sketch of Mr Girard's boiler and price comparisons for cotton. (1 document)

JWP C4/D28 1814-1836 Miscellaneous collection of plans and engravings, including a plan of a house by John Rennie, 1819; designs of a maze, summerhouse etc for the garden of Aston Hall, 1836; drawing of Miss Floyd's cottage, Sidmouth, n.d.; drawing of honeycomb wall at Chilham Castle, Kent, nd; plan of a large greenhouse, nd. (15 documents)

JWP W/3 [1816] Manuscript copy of Thomas Savery's Navigation Improved, 1698 (dated by watermark). Probably copied by Mylne. (1 document)

JWP 3/46 1817, 1819 Table re rate of the Caledonian's passage from Rotterdam to Cologne, October 1817, with a list of deeds belonging to Mrs Watt's mortgage, 1819. (2 documents)

JWP JW/13 1817-1818 Description of a German tour, probably Watt junior's trip across the channel and down the Rhine by steamboat [not certainly identified]. (1 volume)

JWP 3/34 nd [c1820] Manuscript description in German of a collection of c200 Werner's crystals. (1 document)

JWP 3/44 [1822], 1847 Extracts from the journal written by James Brown on board the 'James Watt', when towing the 'Royal George' yacht, [1822], enclosed with a letter of 1847. (1 volume)

JWP C4/C9 1823 Prospectus of Wye Steam Navigation Company. (1 document)

JWP G/11 1824 Fourth report from the Select Committee on artisans and machinery. (1 document)

JWP JW/5 1825 The century of inventions of the Marquis of Worcester, 1825 edition, with notes probably added by Robert Mylne. (1 volume)

JWP C4/C12-15 1825-1829 Drawings by William Creighton, William Hollins, William Bridgens and Thomas Rickman for the James Watt Memorial Chapel at St Mary's Church, Handsworth. (4 rolls)

JWP C4/D24 nd [c1825] Designs for a cottage [in Aston Park?]. (6 documents)

JWP 3/51 nd [c1825] Manuscript short history of the steam engine, probably written by James Watt junior. (1 document)

JWP 3/24 1826 Deed of agreement of the Dublin and London Steam Marine Company, with a list of stockholders, [printed in Dublin]. (44 pages)

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JWP 3/26 nd [c1825] Memoir of James Watt by James Watt junior and Francis Jefferey from the supplement to the Encyclopaedia Britannica volume 6. (32 pages)

JWP C4/16-17 1827-1837 Architect's drawings of the Greenock Library, with site plans etc (William Burn, archt.) (2 rolls)

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JWP JW/4 1829 The Edinburgh Journal of Science, no 19, with a 'Biographical Account of Alexander Wilson, late Professor of Practical Astronomy in Glasgow', (pp1-17), also 'Account of the Steam Engines in Cornwall' by W J Henwood (pp 34-49) and 'On the Duty of Steam Engines in Cornwall' by John Taylor Esq F R S "To The Editors of the Philosophical Magazine and Annals", (pp 425-431) (1 volume)

JWP 4/79 1829 Miscellaneous papers concerning steam navigation, including a 'Short History of Steam Navigation written at the request of Capt Basil Hall'. (1 bundle)

JWP C4/D34 1830 Engraving of a Braithwaite and Ericson locomotive. (1 document)

JWP 4/75 nd [c1830] List of employees of Boulton & Watt, with notes on the nature of their employment, their salaries, and the circumstances of their deaths or their leaving the company's employment, covering the years 1808-1830, with a history of the steam engine, nd, and draft letters to William Adam about piracies. (4 documents)

JWP 3/33 1831-1836 Papers concerning the General Steam Navigation Company, including two printed Acts and an alphabetical lists of the Directors, 1836. (1 bundle)

JWP 3/55 1834 Reports by eminent engineers on the improvement of the river Clyde from 1752 to 1834, Glasgow, 1834. (1 document)

JWP G/4 nd [c1834-1838] 1st proofs of M Arago's Eloge historique de James Watt, with corrections and additions by James Watt junior. (1 bundle)

JWP G/3 nd [c1834-1838] 2nd proofs of M Arago's Eloge historique de James Watt, incorporating many of the corrections from the first proofs. (1 bundle)

JWP C4/D26 1835-1837 Architectural plans and elevations for Heathfield House, including designs for lodge, 1835, summer house, 1836 and garden house, 1836. (7 documents)

JWP C4/D19 c1835-1837 Plans and drawings of Greenock Library (Edward Blore, architect) (1 parcel)

JWP G/19 1837 Notes on Arago's memoir of James Watt and additional memoranda. (15 pages)

JWP G/16 (1837) Abstract of the dates relative to the origin and progress of steam navigation, 1837, with details of vessels, tonnage, steam power etc supplied by Boulton & Watt (watermark 1847). (1 document)

JWP 3/72 1839, 1846 Obituary and register, compiled by James Watt junior, noting the deaths of employees, family and friends and other memoranda; "*William Creighton found frozen in the road, 22 January 1815; therm. at 9°*"; "*Zaccheus Walker died at Soho, April 1822*"; "*J. Furnell Tuffin died October 1820*"; "*William Creighton died February 1831 in his 52nd year*", with a letter from Agnes Gibson, 1846. (1 volume)

JWP G/5 1839 Published version of M Arago's Eloge historique de James Watt, Paris 1839; uncut. (1 volume)

JWP G/17-18 1839 Reviews of Arago's Eloge from Glasgow Herald, 4 October 1839 and Glasgow Constitution, 11 December 1839. (2 documents)

REEL 44

JWP JW/3 1840 The Edinburgh Review, no 70, with an article on the life of Thomas Telford, without annotations. (1 volume)

JWP 3/25 [1845] Extract from Henry Brougham's Lives of Men of Letters and Science, 1845 (pp 337-448 with information on Black, Watt, Priestley, Cavendish and Davy) (1 document)

JWP 4/56 1845 Report by Messrs Hart of Glasgow of a conversation with James Watt in 1817, in which he recollected the early days of the steam condenser, with a related letter from James Watt junior, 1845. (Printed in James Watt and the Steam Revolution) (1 document)

JWP 3/48 nd [post-1848] Short memorandums of the different firms under which Mr Boulton and Mr Watt and there sons have carried on business, 1775-1830, post-1848. (1 document)

JWP 3/61 nd Plan of a house (unidentified). (1 document)

JWP 3/62 nd Unidentified drawing. (1 document)

JWP 3/70 nd Packet of small printed labels endorsed 'Stamps to prevent forgery'. (1 bundle)

JWP C4/C1-3 nd Handwritten extracts from James Watt's correspondence with Dr William Small and Dr John Roebuck, with a single sheet noting the dates of letters addressed to Watt at Kinneil. (3 documents)

JWP C4/C8 nd Handwritten 'Essay on improvements in the art of bleaching' with pencil note on the title page 'by James Rennie, A M'. (1 volume)

William Hamper's Collections for the Parish of Aston

William Hamper's collections relating to the parish of Aston came into James Watt junior's possession in the 1830s; correspondence about their acquisition is in the Muirhead papers at Birmingham Central Library (also published by Adam Matthew Publications). The papers were arranged by Hamper or his executors in a series of parcels, numbered bundles 1-13;

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(C4/F1-14, C5/15 and C5/24, below, have lost their wrappings but were apparently bundles 1,4, and 9 respectively).

JWP C4/F1-14 c1740-1829 'Some account of the parish of Aston...being Dugdale's History ...with considerable additions and illustrations by William Hamper, 1821', with a large quantity of supporting material. Loose papers include ten estate plans reduced by Hamper from original surveys by Tomlinson c1760 and others, including a survey of Water Orton, 1831; drawings of funerary monuments by Hamper and J Clarendon Smith; plans of Kilcup Charity Estates (two plans by John Snape, 1806, 1807) and Billingsley estate, nd; plans of proposed arrangement for new Deritend chapel, c1740 (apparently showing relationship to previous church); engravings of Holy Trinity, Bordesley, nd [c1820]; drawings of Ward End Chapel and Water Orton Bridge; pew certificate for Aston church, 1790; engravings of Sheriff's map of Birmingham, 1792 and sale plan of land at Duddeston, 1829. (1 volume, 1 bundle)

REEL 45

JWP C5/16 nd [early 19th century] Three printing plates, depicting Ward End church, a portrait of Mary Bond d.1611 aged 97, and two seals. [bundle 2] (3 documents)

JWP C5/17 nd [early 19th century] Wood blocks of facsimile autographs of people connected with the parish of Aston. [bundle 3] (16 documents)

JWP C5/15 1367-1828 Portfolio marked 'Aston Manor (& general memoranda about Aston parish)', containing Hamper's collection and working notes. Includes letters from Lord Weymouth to Sir Charles Holte, 1701; innkeeper's bill to Edward Cotton, 1727; inventory of Elizabeth Holte, 1647; particulars of the lordship of Aston, 1680; numerous notes, apparently by Hamper, concerning charities, the Golden Cross inn, incumbents of the parish since 1254, gravestones and monumental inscriptions, extracts from the parish records, wills, register of death from smallpox since 1784, list of local dialect words; folder of notes about Aston Hall, including an inventory of pictures and arms, 1815, a genealogy of the Holte family from 1321 and notes on the family history by Sir William Dugdale; five deeds, including one of 1369, and letter from Thomas Holte, 1637, with enclosure. (1 portfolio)

JWP C5/18 1345-c1830 Portfolio marked 'Deritend and Bordesley' containing similar material to C5/15, above, for the hamlets of Deritend and Bordesley, including Hamper's notes, various private Acts of Parliament, estimates for repairs to Deritend Chapel, 1792 and Deritend Bridge, 1789, with a coloured plan of the bridge, trust deed and plan of Billingsley Charity Estate, deeds 1345-1684, and sale posters for land, 19th century, [bundle 5]. (1 portfolio)

REEL 46

JWP C5/19 1411-c1830 Portfolio marked 'Duddeston, Nechells, Saltley and Little Bromwich', containing similar material to C5/15, above, for those hamlets, including Hamper's notes, deeds, 1411-1418 etc, [bundle 6]. (1 portfolio)

JWP C5/20 early 19th century Portfolio marked 'Castle Bromwich and Water Orton' containing similar material to C5/15, above, for those hamlets, including Hamper's notes, [bundle 7]. (1 portfolio)

JWP C5/21 [?15th century-c1830] Portfolio marked 'Erdington (including Pipe) and Witton' containing similar material to C5/15, above for those hamlets, including Hamper's notes, pedigree of Bagot family of Pipe Hall, and two early deeds, [bundle 8]. (1 portfolio)

JWP C5/24 c1200-14th century Box of medieval deeds with seals (some quite fine), mostly relating to Erdington, [not numbered but apparently bundle 9]. (1 box)

JWP C5/22 15th-17th century Bundle of old deeds of Aston and Birmingham, [bundle 10]. (1 bundle)

JWP C5/23 14th-18th century Box of ancient seals relating to Aston etc, including one of Sir William Bagot, 1393/94, [bundle 11]. (8 seals)

REEL 47

JWP C5/26 [?16th century] Copies of title deeds to property in Aston, [bundle 12] (3 rolls)

JWP C5/25 1447-1590 Deeds of Duddeston, 1468-81; Bordesley, 1447/8; Birmingham and Duddeston, 1589/90; Saltley, 1470/71; Nechells, 1540/1; Birmingham and Bordesley, 1507/8, 1511; Duddeston and Handsworth, 1531/2, [bundle 13]. (10 documents)

Gregory Watt, (1777-1804) Personal correspondence

JWP 6/14 1792-1801 Letters from his parents. James Watt writes with Soho news and Mrs Watt with domestic news and news of friends. (69 documents)

JWP C2/14 1796-1804 Letters from various correspondents, including William Creighton, John Southern, James Keir, Dr Headlam, A Albertini, Robert Muirhead, Gilbert Hamilton, Josiah Wedgwood jnr (about a figure Gregory had commissioned), Francis Jeffrey and Davies Giddy. (126 documents)

REEL 48

JWP C2/9 1797-1804 Letters from his brother, James Watt junior, about family business. (18 documents)

JWP 4/70 1798-1800 Letters from M Deriabin about minerals, including one long letter from St Petersburg and a list of minerals. (10 documents)

JWP C2/11A 1798-1803 Letters to, but mainly from, Gregory Watt. (10 documents)

JWP 6/10 1801-1804 Letters from William Creighton about lead mines, geology, architecture, a tour in Scotland etc, with sketches and drawings in the text. Includes sketch plan and section of the black lead mine at Old Cumnock, and tables of geological strata. (27 documents)

JWP 3/17 1802-1804 Press-copy letter book of Gregory Watt, including private letters to R Hamilton of Stoke and Mr Jackson of Ayr, not indexed. (1 volume)

JWP 6/22 1803-1804 Letters from Gregory Watt to William Creighton, mostly concerning mineralogy. (15 documents)

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JWP 6/5 1804 Letters from various correspondents, including Thomas Campbell and John Young, and correspondence with Francis Jeffrey. Also includes Gregory Watt's Observations on basalt and the transition from the vitreous to the stony texture, London 1804. (1 folder)

Miscellaneous papers

JWP 6/1 (1775)-1802 Commonplace book, mostly dating to 1801-02, including notes on Rome, extracts from printed sources etc; only 20 pages filled. The volume is uniform with JWP 6/2 (please see Reel 50), Gregory's notes on mineralogy, and although not certainly identified as being his, appear to be so. (1 volume)

JWP C4/D33 1790-1840s Numerous drawings, designs, exercise books, maps, some signed Gregory Watt, J[essie] Watt, J Miller, A Miller, J Watt Gibson Watt, including some drawings of busts by Gregory Watt, drawings of churches signed J Watt, and numerous fabric designs and drawings of trees. (1 bundle)
JWP C4/18A nd [c1793] Exercise book. (1 volume)

JWP 6/7 1793 Manuscript copies of poems by various authors, including Thomas Campbell, Tooke's seditious songs, and G Steevens etc; also Fillan and Oscar, nd, [printed]. (1 bundle)

JWP C1/34 nd [c1793] Drawing by Gregory Watt. (1 document)

JWP JW/7 1794-1795 Folder containing a diary, October 1794-July 1795 and miscellaneous papers including a printed catalogue of minerals. (9 documents)

REEL 49

JWP 6/3 1794-1795 Translation of the first book of Homer's Iliad and Society Speeches, by Gregory Watt. (1 volume)

JWP 6/13 1794-1795 Commonplace book of poems presented to Gregory Watt by Thomas Campbell, 1794; with a translation by Gregory Watt of the Choephorae of Aeschylus, 1795. (2 volumes)

JWP 6/60 1777, nd [c1795] Choephorae of Aeschylus, Glasgow, 1777; with manuscript translation by Gregory Watt. (1 volume)

JWP 6/6 1795-1801 Poems by Gregory Watt on various subjects. (1 envelope)

JWP 6/4 1796 School essays on a variety of subjects. (2 volumes)

JWP 6/8 1797 Fragment of a novel by Gregory Watt in imitation of Sterne, Castle of Otranto and Sir Bertrand; a rough draft (104 pp), never corrected or completed. (1 volume)

JWP 6/9 1797 Translation of Bürger's 'The Parson's Daughter' by Gregory Watt. (1 document)

JWP 6/15 1797-1801 Folder containing receipts and accounts. The folder is formed from the cover of an old volume, with a few pages of accounts not cut out, undated but post-1795; these include several payments of interest, eg "*for dinner at Lunar meeting*" etc and one loose account dated 1797 also refers to expenditure at a Lunar Society meeting. (60 documents)

REEL 50

JWP 6/58 1797-1804 Three printed books: Walter and William, an historical ballad, London, 1797, signed by William Withering jnr; a presentation copy of T Campbell, The pleasures of hope, Edinburgh, 1799, with many pencil markings; and a presentation copy of Professor Young's Martial effusions of ancient times addressed to the Spartan Hosts, London, 1804. (3 volumes)

JWP C4/C11 1798-1802 G Wad (ed.), Tabulae Synopticae Systematis Oryctognostici Werneriani with a lengthy manuscript 'Mineral sistem', 1802, in the handwriting of Gregory Watt. (1 volume)

JWP 6/16 nd [c1798-1800] A bundle of loose papers labelled 'Mineralogical and Metallurgical', including accounts of furnaces etc. (22 documents)

JWP C2/8 1798-1802 Accounts of 'mineralogical expenses'. (1 volume)

JWP 6/2 1799-1804 Notes on mineralogy, including observations on minerals in water etc. (1 volume)

JWP C2/24 1800 Packet containing Rules and Orders, List and request for money from the Linnean Society of London. (1 bundle)

JWP 6/12 1800-1801 Leather folder containing two maps of Scotland by Gregory Watt, a poem by Thomas Campbell, and school poems by Gregory Watt, apparently returned, by William Withering jnr, after Gregory's death. (1 folder)

JWP C2/13 1801 Packet containing lettre d'indication, plan of the Exchange, notes and letters of credit of Hammersleys & Co. for Gregory Watt's European travels. (1 bundle)

JWP C2/16-23, & C2/25 1801 Introductory letters for Gregory for his European tour, from Lord Hawkesbury, Mr Hatchett, Dr Headlam, Mr T Musgrave, M Miollis, M Leveque and the French Commission to England among others. (9 bundles)

JWP C2/26 1801 Licence to go to France. (1 document)

JWP C2/1 1801 Memoranda of travels in Germany, Switzerland and France, with a few sketches. (1 volume)

JWP C2/6 1801-1802 Mineralogical remarks on a journey from Hamburg to Basle and from Verona through Tyrol, Bohemia, Saxony and the Hartz to Holland (about 40 pp, small quarto). (1 folder)

JWP 6/40 1801-1804 Miscellaneous accounts, 1801-1802, with four letter from Gregory Watt to his brother, James Watt

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junior about coal beds, mines etc, and (in June 1804) his desire to give up business. (1 bundle)

REEL 51

JWP C2/11B 1802 Papers relative to his tour of 1802. (1 bundle)

JWP C2/2 1802 Memoranda of Travels in France and Italy, with a few sketches. (1 volume)

JWP C2/7 nd [c1802] Printed Geological map of Italy. (1 document)

JWP C2/3 1802 Memoranda of travels in Italy, Germany and Holland, with a few sketches. (1 volume)

JWP 6/57 1802-1804 Passports of Gregory Watt. (1 bundle)

JWP 6/39 1803 Bundle of miscellaneous accounts. (1 bundle)

JWP C2/4 1803 Memoranda of travels in Scotland, with a few sketches. (1 volume)

JWP C2/5 1803-1804 Memoranda of travels in Scotland, with a few sketches. (1 volume)

JWP C2/27 1803-1804 Small bundle of accounts. (1 bundle)

JWP 6/11 1803-1804 Mineralogical, metallurgical and geological papers by Gregory Watt, including a draft paper on basalt and a sketch of mineralogy in Cornwall, prepared for William Withering jnr. (24 documents)

JWP 6/49 1804 Rolled bundle of miscellaneous geological papers. (13 documents)

JWP C4/C10 1804 Gregory Watt, Observations on basalt... (1 document)

JWP 6/56 1804 Bundle of epitaphs on Gregory Watt, with related letters. (1 bundle)

JWP C2/28 1804 Biographical memoir of Gregory Watt, 1777-1804. (1 document)

JWP 3/68 1870 Inventory of books, manuscripts, and prints used by Patrick Muirhead for writing works on James Watt and Gregory Watt. (1 document)

JWP 3/73 nd Red pocket book, Gregory Watt's (casing only). (1 document)

JWP 6/59 nd [ante-1804] Manuscript tables re minerals. (1 folder)

JWP 6/66 nd [ante-1804] List of mineral specimens for Dr Thomson. (1 document)

JWP C4/D32 nd Engraving of a basaltic quarry, Rowley [Regis] (Staffs). (1 document)

JWP C4/D35 nd Large volume with heraldic inscriptions. (1 volume)

Additions to the Collection Papers of James Watt and James Watt junior

JWP C7/1 1780-1784 James Watt's Ink Book. Ivory pocket book marked in Watt's hand 'Ink Book 1780'. About 25 pages filled, all concerning chemical constituents for a suitable ink for Watt's copying process, mainly Watt's detailed descriptions for a series of experiments with different inks, numbered 9 to 31 and dated between 4-26 November 1780, but with further work to 1784. The book contains a further 8 small loose pieces of copy paper with writing, these are either samples of copying with different inks dated, or other formulae for ink. (1 volume)

JWP C7/2 1817 Pocket book of James Watt junior, including notes on the Caledonia. (1 volume)

JWP C7/3 1796-1808 Bill of costs, A & J Weston to Boulton & Watt. A detailed 157 page Bill, covering much of patent litigation totalling nearly £7,000. (1 document)

JWP C7/4 1809-1818 Large roll containing 23 engineering drawings, mostly engineering working drawings for manufacture of lathes, pantograph etc, extensively annotated by James Watt with instructions. The drawings are in generally good condition allowing for some workshop use. (1 roll)

JWP C7/5 1805-1816 Bundle in a cover entitled 'Letters & rough sketches &c No 1 to 35'. Includes instructions by Watt for manufacture of a lathe like Mr Murdoch's, but with stated variations; Drawing of lathe spindle of Mr Murdoch's lathe, with comment (not by Watt) on errors; Letter from Watt to Murdoch concerning improved design for spring for endless screw, including sketch; Details by Watt of work on a bust of Cicero and calculations and instructions by Watt headed 'Weighing Machines February 6 1805'. (1 bundle)

REEL 52

JWP C7/6 1812-1816 Bundle with cover endorsed 'Miscellaneous Sketches of Tools & Machinery No 1 to 30'. Includes pencil sketch of frames, with a note by Watt "*This seems more steady than ye other*"; ink drawings of machine parts with notes indicating that they were drawn from drawings by Watt; and working drawing of 'Leading Screws for Heathfield Machine, April 1813' annotated by Watt, with a note "*NB not having the other drawings before me the perpendicular heights are laid down by estimations*". (1 bundle)

JWP C7/7 c1761-c1817 Large bundle entitled 'Old papers, drawings &c'. Miscellaneous papers that are not numbered or marked individually, and it seems clear that this is odds and ends which the sorter could not find a place for elsewhere: nevertheless some of the material is interesting. (1 bundle)

JWP C7/8 c1794 Standard form printed leases granted by James Watt to various tenants. (19 documents)

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JWP C7/9 1836-1844 Memoranda by James Watt junior of 'books lent to him by Mr Mylne' in 1839 and returned in 1844, together with a copy of Walker's report of the Clyde Navigation, annotated '11 February 1836'. (2 documents)

JWP C7/10 1865 Newscutting from Illustrated London News, describing Heathfield and Handsworth. (1 document)

Papers of John Watt senior, Uncle of James Watt

JWP C7/11 1728 Survey papers and plans marked 'Lands of Inchinnan, 1728 John Watt'. (1 roll)

JWP C7/12 1733 Survey papers and plans marked 'Barrowfield papers (scale given), Kennyhill papers (same scale) January 1733 Jno Watt'. (1 roll)

JWP C7/13 nd Survey papers and plans marked 'Kenny Hill grounds, Jno Watt'. (1 roll)

JWP C7/14 nd Survey papers and plans marked 'White Inch, Jno Watt. (1 roll)

JWP C7/15 nd Survey papers and plans marked 'Auchtifardle's proof, &c &c, Jno Watt'. (1 roll)

JWP C7/16 nd Survey papers and plans untitled marked '? South West from Paslay, Jno Watt' (1 roll)

JWP C7/17 nd Survey notebook, cover missing, part full of notes of distances etc. (1 volume)

JWP C7/18 c1728-c1730 Large bundle of papers containing sub-bundles of different named surveys and various other papers. (c24 documents)

REEL 53

Further Papers of James Watt senior

JWP C7/19-20 1735-1745 North Carolina Papers: masters and merchant accounts, invoices, bills of lading, masters' commissions, bills of exchange, correspondence from Watt's shipmasters or his factors in Carolina or agents in Boston etc, apparently continuous. (2 of 3 bundles)

REEL 54

JWP C7/21 1746-1753 North Carolina Papers: masters and merchant accounts, invoices, bills of lading, masters' commissions, bills of exchange, correspondence from Watt's shipmasters or his factors in Carolina or agents in Boston etc, apparently continuous. (3rd of 3 bundles)

JWP C7/22 1747-1764 Anderson Papers: A bundle, similar to the North Carolina Papers above, marked 'George Anderson & Snow Manie's 1747-1764', concerning the building by Watt and Anderson of the snow 'Menie' in 1747-8, its voyages and sale, and working out of partnership accounts. (72 documents)

REEL 55

JWP C7/22 cont 1747-1764 Anderson Papers: A bundle, similar to the North Carolina Papers above, marked 'George Anderson & Snow Manie's 1747-1764', concerning the building by Watt and Anderson of the snow 'Menie' in 1747-8, its voyages and sale, and working out of partnership accounts. (71 documents)

Finlay & Calion Papers: The following are all bundles of accounts, invoices, bills of lading, charterparties, commissions, bills, correspondence from foreign agents in Boston, Barbados, Gibraltar, Cadiz, Madeira, Cork, Isle of Man &c and correspondence to Watt from his partners Robert Finlay, Walter Maxwell and David Calion concerning partnership trading between 1748-1754 and the subsequent working of their affairs.

JWP C7/23 1747 Finlay & Calion Papers. (1 bundle)

JWP C7/24 1748 Finlay & Calion Papers. (1 bundle)

REEL 56

JWP C7/25 1749 Finlay & Calion Papers, no 1. (1 bundle)

JWP C7/26 1749 Finlay & Calion Papers, no 2. (1 bundle)

REEL 57

JWP C7/27 1750 Finlay & Calion Papers, no 1. (1 bundle)

JWP C7/28 1750 Finlay & Calion Papers, no 2. (1 bundle)

REEL 58

JWP C7/29 1751 Finlay & Calion Papers, no 1. (1 bundle)

JWP C7/30 1751 Finlay & Calion Papers, no 2. (1 bundle)

REEL 59

JWP C7/31 1752 Finlay & Calion Papers. (1 bundle)

JWP C7/32 1753 Finlay & Calion Papers. (87 documents)

REEL 60

JWP C7/32 cont 1753 Finlay & Calion Papers. (29 documents)

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JWP C7/33 1754 Finlay & Calion Papers. (1 bundle)

JWP C7/34 1755-74 Finlay & Calion Papers. (1 bundle)

REEL 61

JWP C7/35 1762-1764 Finlay & Calion Papers; 'Robt Donaldsons Affair'. (1 bundle)

Pocket Account books of James Watt senior: Greenock and Glasgow Business books usually accounts or receipts but sometimes including orders, notes of distances etc.

JWP C7/36 1725-1727 Pocket Account book. (1 volume)

JWP C7/37 1729-1732 Pocket Account book. (1 volume)

JWP C7/38 1733-1736 Pocket Account book. (1 volume)

JWP C7/39 1735-1737 Pocket Account book. (1 volume)

JWP C7/40 1737-1741 Pocket Account book. (1 volume)

JWP C7/41 1741-1743 Pocket Account book. (1 volume)

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JWP C7/42 1743-1746 Pocket Account book. (1 volume)

JWP C7/43 1746-1747 Pocket Account book. (1 volume)

JWP C7/44 1747-1748 Pocket Account book. (1 volume)

JWP C7/45 1748-1749 Pocket Account book. (1 volume)

JWP C7/46 1748-1752 Pocket Account book. Entries for 1775 title 'A piece of a day book'. (1 volume)

JWP C7/47 1749 Pocket Account book. (1 volume)

JWP C7/48 1749-1751 Pocket Account book, with a note on the back "*Non of Youngs Jame's days in this book*". (1 volume)

JWP C7/49 1751-1752 Pocket Account book, with a similar note. (1 volume)

JWP C7/50 1752-1753 Pocket Account book. (1 volume)

JWP C7/51 1753-1754 Pocket Account book, with a similar note. (1 volume)

JWP C7/52 1754-1755 Pocket Account book. (1 volume)

JWP C7/53 1756-1758 Pocket Account book. (1 volume)

REEL 63

JWP C7/54 1758 Pocket Account book, cover lost. (1 volume)

JWP C7/55 1759-1760 Pocket Account book. (1 volume)

JWP C7/56 1760-1762 Pocket Account book. (1 volume)

JWP C7/57 1762-1764 Pocket Account book. (1 volume)

JWP C7/58 1764-1765 Pocket Account book. (1 volume)

JWP C7/59 1765-1766 Pocket Account book. (1 volume)

JWP C7/60 1766 Pocket Account book, Salt Accounts. (1 volume)

JWP C7/61 1766-1769 Pocket Account book. (1 volume)

JWP C7/62 1773-1774 Pocket Account book. (1 volume)

JWP C7/63 1774-1775 Pocket Account book. (1 volume)

JWP C7/64 1704-1710 Pocket debt receipt book, part full. (1 volume)

JWP C7/65 nd Thin book, pages mostly torn out, 'This book has belonged to Tho Watt of Crawfordshire', a page of debts from son James and 2 pages of calculations. (1 volume)

JWP C7/66 nd Mathematical Texts, inside title 'Practical Megethometry, Longimetry'. (1 volume)

JWP C7/67 nd Pocketbook mostly in Latin, inside title 'Annotationes'. (1 volume)

REEL 64

JWP C7/68 1747-1749 Ledger. (136 folios)

JWP C7/69 1754-1757 Ledger. (110 folios)

JWP C7/70 1767-1770 Ledger. (144 folios)

JWP C7/71 1771-1774 Ledger. (133 folios)

JWP C7/72 1772-1776 Ledger. (67 folios)

REEL 65

JWP C7/73 1737-1739 Daybook. (1 volume)

JWP C7/74 1744-1746 Daybook. (1 volume)

JWP C7/75 1765 Daybook. (1 volume)

JWP C7/76 1765-1766 Daybook. (1 volume)

JWP C7/77 1765-1774 Ledger. (1 volume)

JWP C7/78 nd Two account books (one inside the other) of business with the Town of Greenock. (2 volumes)

JWP C7/79 1742-1745 Narrow ledger: North Carolina account book. (1 volume)

JWP C7/80 [1767] Lists of ships and boats debts and small debts ??? (1 volume)

JWP C7/81 1749-1756 Small debts book. (1 volume)

JWP C7/82 1754 'Primrose Dalrymple his Astronomy Book', a text book about ¼ full of model exercises in astronomy etc. (1 volume)

[<back](#)

Letter Book Index

These names have been copied from the microfilm indexes at Aberystwyth which are difficult to read in places. Also in the different volumes, Watt may not have used the same initials for the same person or a different person may have the same name and initials in different volumes. Hence this typescript will need to be checked against the originals.

The entry is given as JWP (James Watt Papers), LBx (x). The first x gives the number of the Letter Book and the second the number of page references in the index but there may be more than one letter on a page. However this list will give a rough idea of the people with whom Watt corresponded and the frequency. This list gives all Watt's entries in his indexes which sometimes include an object such as 'veranda'.

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Letter Book 4 1803-1810
Letter Book 5 1810-1818
Letter Book 6 1818-1819

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Barker, Geo. - JWP LB4 (1)
Barker, G H - JWP LB2 (1), LB5 (1)
Barker & Untd. - JWP LB5 (1)
Barnes, H W - JWP LB5 (1)
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Notes on Individuals

ACCUM, Freidrich (aka Frederick) Christian (1769-1838). Chemist; scientific lecturer at Surrey Institute, 1803; advocated introduction of gas street-lighting; director of London Gaslight & Coke Co, 1810; went to Berlin, 1822; wrote several scientific works.

ARAGO, W. French writer, who compiled an Eloge historique de James Watt, delivered as a lecture in 1834 and published in 1838 after consultation with James Watt junior.

ARGAND, Aimé. A Swiss physician and scientist, inventor of a significant improvement in the oil lamp, which he introduced first in France, but brought to England in 1783 and patented, 1784; Boulton, Watt, Darwin and Robison all assisted him with designs and improvements, but the patent was successfully challenged, 1786 and Argand returned to France remaining in friendly contact with Boulton and Watt on a range of scientific matters.

ARKWRIGHT, Sir Richard (1732-92). Engineer; apprenticed to a barber and set himself up in that trade in Bolton before 1755; turned his attention to mechanical inventions c1767; invented and erected a spinning mill near Hockley, 1769; went into partnership with the stocking manufacturers at Cromford (Derbys), 1771; patented improvements in yarn manufacture, 1775; his repeated complaints about the infringements of his patents were defeated by a combination of rival manufacturers in the courts, 1785; built mills in Derbyshire and Lancashire; introduced Boulton & Watt engine into mill at Nottingham, 1790; kt 1786; high sheriff of Derbyshire, 1787.

BEDDOES, Dr Thomas (1760-1808). Physician, MD, Pembroke College, Oxford; studied medicine at London and Edinburgh; reader in chemistry at Oxford, 1788-92; succeeded in establishing at Clifton, Bristol a 'Pneumatic Institute' for the treatment of disease by inhalation of gases, 1798; married Anna, daughter of R.L. Edgeworth and sister of Maria Edgeworth; wrote and edited several medical and other works.

BEECHEY, Sir William (1753-1839). Painter, first exhibited 1775; ARA; portrait painter to Queen Charlotte; kt and RA, 1793; painted portraits of James Watt and Matthew Boulton.

BERTHOLLET, Claude-Louis (1748-1822). French chemist; graduate of Turin in medicine; settled in Paris, 1772; private physician to due de Orleans; member of Academy of Sciences, 1780; adherent of Lavoisierian school of chemistry; investigated composition of ammonia, sulphuretted hydrogen and prussic acid; proposed use of chlorine as a bleaching agent, 1785; served on various scientific commissions for the Revolutionary government; published a treatise on dyeing, 1794; taught in the polytechnics and ecoles normales of Paris, 1794; accompanied Napoleon to Egypt, there being one of the scientists founding the Institute of Egypt; senator and grand officer of Legion d'Honneur; under the empire he became a count, and on the restoration of the Bourbons took his seat as a peer.

BLACK, Dr Joseph (1728-99). Chemist; studied medicine at Glasgow and Edinburgh, where he graduated MD with an important thesis, 1754; professor of medicine, Glasgow, 1756-66; practised as a physician; made investigations into the question of 'latent heat' which formed the basis of modern thermal science and gave the first impulse to Watt's improvements to the steam engine, 1756-62; experimented with the object of testing thermometrical indications, and originated theory of 'specific heat', 1760; professor of medicine and chemistry, Edinburgh, 1766-97. He was first physician to George for Scotland and a member of the Royal Society, Edinburgh, and the Royal College of Physicians.

BOULTON, Matthew (1726-1809). Entrepreneur and engineer; established Soho Manufactory, Birmingham, for large-scale production of small metalwork items, 1762; entered partnership with Watt for commercial development and production of steam engine, 1773; diversified business interests into fine art silverware and ormolu, coins and medals, production of minting machinery; made coins for Great Britain and other countries; supplied new Mint with machinery, 1805; FRS; member of the Lunar Society.

BRAMAH, Joseph (1748-1814). Inventor, worked as a cabinet maker in London; invented Bramah locks; patented the Bramah hydraulic press, 1795.

BRIDGENS, Richard H. Pupil of the sculptor and modeller George Bullock; attempted to establish himself in architectural practice in Birmingham; James Watt jnr employed him extensively to design furniture for Aston Hall, but before 1825 lack of work obliged him to leave the city.

BUCHANAN, Robertson (1770-1816). Civil engineer and millwright of Glasgow; published treatises on machinery.

BULLOCK, George (d. 1818). Sculptor and modeller of Liverpool, exhibiting statues and furniture 1804-16; worked for James Watt junior at Heathfield Hall.

CAMERON, ROBERT. Employee of Boulton and Watt at Soho for some years. Patented a steam engine in 1784 on his own account, and two years later a method of raising coal and ores from mines; in partnership with Humphrey Jeffreys for a few years; bankrupted in 1792 and confined to a debtors prison.

CAMPBELL, Thomas (1777-1844). Poet; son of a ruined Glasgow merchant; at Glasgow University, 1791-96 with Gregory Watt; settled in Edinburgh as law clerk and published the Pleasures of Hope, 1799; travelled in Germany and Denmark, 1800-01; pensioned by the Crown, 1805; resided in or near London as a man of letters, 1804-44; edited the New Monthly Magazine, 1820-30; lord rector of Glasgow University, 1826-29; visited Algiers, 1835; died at Boulogne, 1844.

CATHCART, Charles (9th Baron Cathcart) (121-76). Soldier; entered army when very young; succeeded to barony, 1740; lieutenant-colonel 1745; protégé of Duke of Cumberland; hostage in Paris, 1748; lieutenant-general, 1760; envoy to Russia, 1768-71; pioneer of canal building in Scotland, 1771-76; commander of forces in Scotland.

CAVALLO, Tiberius (1749-1809). Scientist; born in Naples; settled in England before 1775; FRS 1779; investigated electrical and chemical phenomena; invented electrical apparatus; wrote on electricity and magnetism; interested in ballooning.

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CHANTREY, Sir Francis Legatt (1781-1841). Sculptor; son of a carpenter near Sheffield; apprenticed to a Sheffield wood-carver, 1797-1802; learnt drawing, carving and oil painting; lived chiefly in London after 1802 painting portraits, studying art and practising carving; exhibited at RA from 1804; FRS 1818; kt in 1835; executed memorial bust of James Watt; bequeathed his property to RA.

CHAPMAN, William (1749-1832). Engineer; constructed canals in Ireland and docks in England and Scotland; wrote on canal navigation and the Corn Laws.

CLAGGET, Charles (?1740-?1820). Musician and instrument-maker. Probably lived in Glasgow early in the 1760s. In the orchestra at the Dublin theatre, c1766; came to London, 1766; patented musical inventions, 1776 and 1788; visited by Haydn, 1792; published pamphlets.

CLEGHORN, George (1716-89). Physician, educated at Edinburgh; army surgeon in Minorca, 1736-49; MD; published observations on diseases epidemic in Minorca, 1751; lecturer and professor of anatomy in Dublin, 1751-89.

COPELAND, Professor Patrick. Professor of Natural Philosophy at Marischal College, Aberdeen; shared interest of Watt in bleaching technology.

CORT, Henry (1740-1800). Ironmaster; navy agent in London, 1765-75; developed process for purifying iron by 'puddling' at Fareham (Hants), patented 1783-84; ruined by prosecution of his partner for embezzlement of navy funds, 1789; pensioned, 1794.

CRAIG, Jonathan (d. 1765). Watt's partner in a mathematical instrument making business from 1759 until his death. He seems to have taken no part in the manufacturing side of the business, but to have kept the books and advanced the greater part of the capital.

CRAIG, William (Lord Craig) (1745-1813). Scottish judge; educated at Edinburgh; advocate, 1768; sheriff-depute of Ayrshire, 1787; a lord of session, 1792-1813; contributed to the *Mirror and Lounger*.

CREASER, Thomas (fl. 1798). Friend of Dr Thomas Beddoes; practised medicine in Bath.

CREIGHTON, William and Henry. Brothers employed by Boulton & Watt as engine erectors and agents. William was for some years based at Soho and became a friend of Gregory.

CRELL, Lorenz. Distinguished German scientist, whom James Watt junior engaged in correspondence on behalf of the Manchester Literary & Philosophical Society.

CROMPTON, Samuel (1753-1827). Inventor of the spinning mule; induced by the imperfections of Hargreaves' spinning jenny to invent a substitute, 1779; gave it to the public, but received no pecuniary advantage; granted £5,000 by the House of Commons, 1812.

CUMMING, Alexander (1733-1814). Mathematician and mechanic; FRS; wrote largely on the mechanical laws and the action of wheels.

DALE, David (1739-1806). Industrialist and philanthropist. Fixed on New Lanark as a site for the erection of cotton-mills in conjunction with Arkwright; partner in cotton-mills at Catrine; established the first Turkey-red dyeing works in Scotland, 1785; imported at his own risk foodstuffs for the poor in times of dearth.

DALRYMPLE, Sir John (1726-1810). Scottish judge, educated at Edinburgh and Trinity Hall, Cambridge; advocated at the Scottish bar, 1748; Exchequer baron, 1776-1807; discovered the art of making soap from herrings; published historical works.

DARWIN, Dr Erasmus (1731-1802). Physician; Exeter scholar, St John's College, Cambridge; MB 1755; corresponded with Rousseau; established a dispensary at Lichfield and was an early member of the Lunar Society of Birmingham; formed botanical garden near Lichfield, 1778. Later moved to Radbourne Hall, Derbys, and founded the Derby Philosophical Society, 1784; declined invitation of George III to become his physician; published *The Loves of the Plants*, 1789; *The Economy of Vegetation*, 1791; both forming parts of his poetic work, *The Botanic Garden*, and wrote the *Temple of Nature*, or the origin of society, 1803; he was also the author of a few prose works, maintaining a form of evolution that was subsequently expounded by Lamarck. Grandfather of Charles Darwin, and father of Dr Robert Waring Darwin of Shrewsbury.

DAVY, Sir Humphrey (1778-1829). Scientist; educated at Penzance and Truro; admitted to Jesus College, Cambridge, 1804; superintendent of the laboratory at Beddoes' 'Pneumatic Institution' in Bristol, 1798-99; published on respiration of nitrous oxide, 1799; nearly died attempting to breathe carburetted hydrogen gas, 1800; lectured on galvanism and pneumatic chemistry at Royal Institution, 1801; chemistry professor, RI, 1802; FRS 1803; Copley medallist of Royal Society 1805; demonstrated the elementary existence of potassium, sodium and chlorine by the agency of the galvanic battery, 1807; discovered composition of oxymuriatic acid, 1807; Napoleon Prize of Institut de France; Hon LLD, Dublin, 1811; Kt 1812; experimented in Italy on composition of ancient pigments and combustion of diamond, 1812-13; invented safety lamp 1815; Bt 1818; PRS, 1820; invented unsuccessful system of protectors for preserving copper bottoms of ships, 1823; died at Geneva, 1829.

DE BOFFE, Mr. A dealer in French and German books on science, the *Annales Chimique* etc. based in Gerard St, Soho, London.

DE LUC, Jean André (1727-1817). Geologist and meteorologist; native of Geneva; settled in England, 1773; reader to Queen Charlotte; FRS; honorary professor of geology at Gottingen, 1798; published various works in England and French. Friend of Aimé an Gregory.

DE LESSERT, M. Banker in France to Boulton & Watt; ruined by the Revolution.

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DUGDALE, Sir William (1605-86). Garter king-of-arms; employed by Sir Simon Archer to collect material for a history of Warwickshire, published in 1656; edited many historical texts; kt 1677.

DUNLOP, John (1755-1820). Song-writer; lord provost of Glasgow 1796; collector of customs at Bo'ness and subsequently at Port Glasgow.

EDGEWORTH, Richard Lovell (1744-1817). Author; led to invent a plan for telegraphing by a desire to know the result of a race at Newmarket; silver medallist of the Society of Arts for a new land-measuring machine, 1768; interested in road and carriage improvement; member of Lunar Society of Birmingham; friend of Darwin, Day and Keir; visited Rousseau and settled at Lyons, 1771; FRS, 1781; settled on estates in Ireland, 1762; aide-de-camp to Lord Charlemont, 1783; raised a corps against the rebels at Edgeworthstown, 1798 and sat in the last Irish parliament; served on a board of inquiry into Irish education, 1806-11; four times married; published on educational and mechanical subjects; his daughter, Anna, married Dr Beddoes.

EWART, Peter (1767-1842). Engineer and millwright. Pupil of John Rennie and later an employee of Boulton & Watt. Established himself in Manchester in 1790s as an engineer and later cotton manufacturer; interested in theoretical mechanics; friend of John Dalton and Thomas Henry; member of Manchester Lit. & Phil. Society, 1798; vice-president, 1812-35.

FRY, Joseph (1728-87). Practised medicine in Bristol and afterwards made cocoa and chocolate; with William Pine began type-founding, 1864, and moved to London; brought out Bible in 5 volumes, 1774-76, and specimens of printing types which he declared to be indistinguishable from the founts of William Caslon, 1785.

FULTON, Robert. American scientist and pioneer of steam navigation.

GALTON, Samuel, junior (1753-1832). Educated Worcester and Warrington Academy, arriving while Priestley was teaching there; Quaker merchant and gunsmith of Birmingham (partner with his father from 1777); regular attendee at scientific lectures in Birmingham; collected scientific instruments; began chemical experiments in 1770s and built a laboratory at his house, 1782-83; member of the Lunar Society of Birmingham, 1781-1803; wrote a paper for Royal Society on prismatic colours, 1782; also interested in ornithology and compiled a book about birds for the use of his children; FRS 1785; chairman, Lancashire School in Birmingham; active in canal-promotion in 1770s-80s; patron of the Society for Promoting the Cultivation of Fine Arts in Birmingham; member of the Lichfield Agricultural Society.

GARBETT, Samuel. Industrialist; partner with Roebuck in the vitriol works at Birmingham and Prestonpans and in the Carron Company; a leading figure in the Birmingham chamber of manufacturers, and concerned with Boulton and Wedgwood in attempts to found a national chamber.

GARNETT, Thomas (1766-1802). Physician and scientist. MD, Edinburgh 1788; practised at Bradford, Knaresborough and Harrogate; analysed the Harrogate spa waters; professor of natural philosophy at Anderson's Institution, Glasgow; professor of natural philosophy and chemistry at the Royal Institution, London, 1799-1801; anticipated modern theory of quasi-intelligence in plants, published *A Highland Tour*, 1800, and *Zoonomia*, 1804.

GIDDY (later GILBERT), Davies (1787-1839). President of the Royal Society; educated Penzance and Oxford; MA 1789; DCL 1832; high sheriff of Cornwall, 1792-93; MP Helston, 1804; Bodmin, 1806-32; promoted cause of science and art in Parliament; acquired large property in Sussex 1808; FSA 1820; early encouraged Sir Humphrey Davy; treasurer of Royal Society, 1820; president 1827-30; selected Brunel's design for Clifton Bridge, 1830; published *Parochial History of Cornwall*, 1838.

GUYOT, A (d. 1794). Of Passy, France. A friend of De Lessert, Boulton & Watt's French banker; employed as a tutor in Edinburgh and on the Continent, and resumed this employment after the Revolution; died at Edinburgh.

HAMILTON, Gilbert. Of Glasgow; brother-in-law of James Watt; involved with Watt and McGrigor in chlorine bleaching experiments, c1780.

HAMPER, William (1776-1831). Antiquary; FSA 1821; contributor to *Gentleman's Magazine*; assisted John Britton and other topographical writers, published a *Life, Diary and Correspondence of Sir William Dugdale*, 1827.

HENDERSON, Logan. Lieutenant in the army; employed by Boulton and Watt from 1776-82 as engine erector etc. in north-east and Cornwall; left the company after incurring the dislike and suspicion of Watt.

HENRY, Thomas (1734-1816). Chemist; practised as a surgeon-apothecary in Manchester; secretary, Manchester Literary and Philosophical Society, 1781 and president 1807; patented process for preparing and Leiden; MD, Leiden, 1749; studied agriculture and travelled to Holland, Belgium and Picardy; partner with James Davie in production of sal ammoniac from coal soot; settled in Edinburgh, 1768; published *Theory of the Earth*, 1795 and other works; originator of modern theory of formation of the earth's crust.

IRVINE, William (1743-87). Chemist; MD, Glasgow; assisted Joseph Black in experiments on steam; lecturer in chemistry at Glasgow, 1770-87; his *Essays*, chiefly on Chemical Subjects, published 1805.

JEFFREY, Francis (Lord Jeffrey) (1773-1850). Scottish judge and critic; educated Glasgow and Edinburgh Universities; admitted to Scots bar, 1794; an ardent Whig; involved in foundation of the *Edinburgh Review*, of which he was editor, 1803-29; visited New York, 1813; active in British politics, 1821-26; dean of Faculty of Advocates, 1829; lord advocate, 1830-34; MP for Malton, 1831-32 and Edinburgh, 1832-; judge of Court of Session, 1834-50; friend of Scott, Wordsworth, Dickens and Macaulay.

KEIR, James (1735-1820). Chemist; studied at Edinburgh; friend of Erasmus Darwin and member of the Lunar Society of Birmingham; issued *Treatise on the different kinds of Elastic Fluids or Gases*, 1777; while managing Boulton & Watt's engineering works, patented a metal said to resemble 'Muntz-metzel', 1779; with Alexander Blair opened alkali works at

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Tipton, the method of extraction being Keir's discovery, 1780; established Tividale Colliery; discovered the distinction between carbonic-acid gas and atmospheric air; FRS 1785; contributed paper concerning experiments and observations on the dissolution of metals in acids, 1790; wrote memoirs of Boulton and Thomas Day. Was also involved in glass manufacture in 1770s.

KNOX, John (1720-90). Scottish philanthropist. Bookseller in London; improved the fisheries and manufactures of Scotland, 1764-90; published works on Scottish fisheries.

LIND, James (1736-1812). Physician. MD, Edinburgh, 1768; fellow of the Edinburgh College of Physicians, 1770; made a voyage to Iceland, 1772; FRS 1777; settled at Windsor and became physician in the royal household; interested in astronomy and science; had a private press at which he printed mysterious little books and Sir Robert Douglas' Genealogies of the families of Lind and the Montgomeries of Smithson. Not to be confused with Dr James Lind (1716-94), surgeon in the navy, who discovered lemon-juice to be a specific for scurvy at sea.

LINDRIANI, Chevalier Marsiglio. Of Vienna, physicist.

LISTER, Pochin. Attorney to Sir Richard Arkwright in the litigation to protect his patents.

McGRIGOR, James. James Watt's father-in-law by his second marriage; a bleacher in business near Glasgow. Watt corresponded with him on the new chlorine bleaching process and other matters.

MAGELLAN, Jean Hyacinthe de (1723-90). Scientific investigator; descendant of the Portugese navigator who discovered the Magellan Straits in 1520; probably born at Talavera; Augustinian monk; abandoned monastic life for scientific research, 1763; reached England, 1764; FRS 1774; published work on English reflecting instruments, 1775; engaged in perfecting the construction of scientific instruments and publishing descriptions of them until his death.

MARR, Captain & Mrs. Captain Marr was a naval officer, and son of Watt's old schoolmaster; his wife was a cousin-german of James Watt. Travelled to London with Watt in 1755. Captain Marr's papers, 1759-87 are in Birmingham Archives (B&W M II/11/1-38).

MARTIN, Benjamin (1704-82). Mathematician, instrument maker and general compiler; schoolmaster and travelling lecturer; published Philosophical Grammar, 1738 and Bibliotheca Technologica, 1737; invented and made optical and scientific instruments; settled in London, 1740; published An English Dictionary, 1849, and Martin's Magazine, 1755-64, and some not very original works; became bankrupt and hastened his death by attempted suicide.

MATTHEWS, William (d. 1792). Matthew Boulton's London banker and agent.

MUIRHEAD, Robert. Cousin of James Watt 1736-1819.

MURDOCK, William (1754-1839). Engineer and inventor of coal-gas lighting; employee of Boulton & Watt, mainly in Cornwall, from 1777-1800; responsible for some of the crucial improvements to the steam engine introduced by Boulton & Watt, e.g. the sun and planet motion; commenced making experiments on gas lighting, 1792; lit the Soho Foundry experimentally from 1800 and regularly from 1803; Rumford gold medallist of Royal Society, 1808; patent for making of stone pipes, 1810.

PEARSON, Richard (1765-1836). Physician, MD Edinburgh, 1786; physician to the General Hospital, Birmingham, 1792-1801; wrote a number of medical treatises.

PENTLAND, Joseph Barclay (1797-1873). Traveller; educated at Armagh and Paris University; surveyed a large part of the Bolivian Andes, 1826-27 and explored other South American districts.

PERCIVAL, Dr Thomas (1740-1804). Physician and author; educated at the Warrington Academy; leading figure in the Manchester Literary & Philosophical Society; practised medicine in Manchester, and published Medical Ethics, 1803; FRS.

PLAYFAIR, Professor John (1748-1819). Mathematician and geologist. Graduate of St Andrews, 1765; minister of Liff and Benvie, 1773-83; joint professor of mathematics at Edinburgh, 1785-1805; professor of natural philosophy, 1805; FRS, 1807; published Elements of Geometry, 1795 and Illustrations of the Huttonian Theory of the Earth, 1802.

PLAYFAIR, William (1759-1823). Publicist; brother of Professor John Playfair; apprenticed to Andrew Meikle; took out several patents, and opened a shop in London for their sale; removed to Paris, not being successful, but (c1793) after taking part in French Revolution returned to London where he wrote against it; earned a precarious livelihood by pamphlets and translations in London; wrote over forty works.

POTT, Joseph Holden (1758-1847). Archdeacon of London; son of Percival Pott, surgeon; educated Eton, St John's Coll, Cambridge; MA 1783; archdeacon of St Albans, 1789-1813, of London, 1813-42; chancellor of Exeter, 1826; wrote works in prose and verse.

PRIESTLEY, Joseph (1733-1804). Theologian and scientist; son of a Yorkshire cloth-dresser; adopted by his aunt, a strong Calvinist; educated in Yorkshire and at Daventry Academy (1751); Presbyterian minister of Needham Market, 1755-58; minister at Nantwich, 1758 and tutor in languages and literature at Warrington Academy, 1761; hon LLD, Edinburgh, 1764; FRS 1766; minister of Mill Hill Chapel, Leeds, 1767; published A history of chemistry, 1767 and An essay on government, 1768; librarian and companion to Earl of Shelburne, 1772-80; published An examination of Scottish philosophy, 1774; associate of French Academy of Sciences, c1772; member, Imperial Academy of Sciences, St Petersburg, 1780; junior minister of New Meeting, Birmingham, 1780; involved in religious controversy and publication, 1782-90; supported French Revolution, and was attacked by a mob at Birmingham, 14 July 1791, which wrecked his house and laboratory and burnt the New Meeting; moved to London, 1791, and to Pennsylvania, 1794. In 1774 he obtained for the first time what he called 'dephlogisticated air', named oxygen by Lavoisier; a discovery which was the germ of the modern science of chemistry.

RENNIE, John (1761-1821). Civil engineer; younger brother of George Rennie, studied at Edinburgh University; entered

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employment of Boulton & Watt, 1784; began business on his own account, c1791; FRS 1798; had a great reputation as a constructor of canals, docks, harbours and bridges. Waterloo Bridge (1810-17), London Bridge and Southwark Bridge (1815-19) were designed by him, as well as the Plymouth Breakwater.

RICKMAN, Thomas (1776-1841). Architect, practised in Liverpool and Birmingham; first distinguished the stylistic development of medieval English architecture and invented the terms in use today; designed Watt memorial chapel at Handsworth church, 1826.

ROEBUCK, Dr John (1718-94). Inventor, studied chemistry and medicine at Edinburgh; MD Leiden, 1742; established a chemical laboratory at Birmingham; invented improved methods of refining precious metals and several improvements in processes for production of chemicals, including the manufacture of sulphuric acid; established manufactory of sulphuric acid at Prestonpans, 1749; formed Carron Company for manufacture of iron on river Carron, Stirlingshire, c1760 (later famous for the production of ordnance) and in 1762 patented a process for the manufacture of iron using pit coal; backed development of Watt's steam engine, 1765-73, but lost large sums of money owing to lack of success with coal mines and salt-works, leased at Bo'ness, where he was afterwards employed by his creditors as manager; sold interests in the Watt engine to Matthew Boulton 1773; member of Royal Societies of London and Edinburgh.

SCALE, John. Partner with Matthew Boulton in the Soho Manufactory from the dissolution of the partnership with John Fothergill in 1781.

SEWARD, Thomas (1708-90). Divine; educated at Westminster and St John's College, Cambridge; MA 1734; prebendary of Lichfield and Salisbury; resided at Lichfield, where he frequently entertained Dr Samuel Johnson; father of the authoress Anna Seward ('the Swan of Lichfield'); himself published religious and poetical writings.

SMEATHMAN, Henry (d. 1786). Promoter of a trading colony on the west coast of Africa, which would also be a place in which to resettle the growing number of black poor in London; the initial settlement made after his death was a failure, but a subsequent refoundation created Sierra Leone (see P. Fryer, *Staying power: a history of black people in Britain*, chapter 8).

SNAPE, John (fl. 1760-1810). Land-surveyor of Sutton Coldfield. Employed extensively in the West Midlands.

SOUTHERN, John (d. 1815). Originally engaged by Boulton & Watt as a draughtsman; manager of the Soho Foundry for Boulton & Watt with a share in the profits, 1800; partner, 1810.

STOKES, Jonathan (1755-1831). Born at Chesterfield; a protégé of William Withering; MD Edinburgh 1782; attended meetings of Royal Society in London as guest of John Hunter, 1780-81; interested in pneumatic chemistry, botany, and the classification of fossils and plants; toured Europe 1783 and established friendships with leading botanists; practised medicine at Shrewsbury and Kidderminster; fellow of Linnean Society; FSA Scot; member of Lunar Society; collaborated with Withering on his *Botanical Arrangement*, but fell out with him over money and the loan of some books.

STRUTT, William (1756-1830). Inventor; eldest son of Jedidiah Strutt; invented the Belper stove, 1806; involved in the heating of the Hunterian museum, Glasgow, 1808.

STELFORD, Thomas (1767-1834). Engineer, son of a Dumfries-shire shepherd; worked as a mason; became interested in literature and published poetry, 1779-84; went to London, 1782; became Surveyor of Public Works for Shropshire; engineer of Ellesmere Canal, 1793, in which capacity he built remarkable aqueducts, 1795-1805; inspected and improved the harbours of Scotland; constructed the Caledonian Canal (a financial failure) and opened up the northern counties of Scotland with 920 miles of new roads and 120 new bridges; constructed canals and roads in England and Gotha Canal, Denmark/Germany, 1808-10; first president of Institute of Civil Engineers; 1818; erected Menai Bridge, 1819; built bridges at Tewkesbury, Gloucester, Glasgow and on the Clyde; buried in Westminster Abbey. Animated by a great public spirit, a man of generous and social disposition, friend of Campbell and Southey; wrote autobiography (published 1838).

VAN LIENDER, J.D. Huichelbos. Of Rotterdam, ?secretary of the Batavian Society of Rotterdam.

WALKER, Zaccheus. A senior Boulton & Watt employee, described as 'our principal and Confidential Clerk' in 1779.

WARDEN, Hugh. A Dublin merchant.

WEDGWOOD, Josiah I (1730-95). Potter; worked as a thrower and later as a modeller from the age of nine; fond of trying experiments; partner in a small pot-works near Stoke, 1751; opened own works at Burslem, 1759; greatly improved ordinary wares, and developed high-quality specialist wares (Egyptian ware, Queen's ware etc); successfully advocated road and canal schemes in potteries district; appointed queen's potter, 1762; opened new pottery and model village at Etruria, 1769; FRS 1783; FSA 1786; published pamphlets; member of the Lunar Society of Birmingham; one of the leading promoters of a national Chamber of Manufacturers at the time of controversy over trade with Ireland, 1785.

WEDGWOOD, Josiah II (d. 1843). Potter; son of the more famous and able Josiah Wedgwood I, and brother of Thomas (Tom) Wedgwood, pioneer of photography; studied at Edinburgh; partner in the family firm of Wedgwood & Byerley, but until 1807 left management of business to cousin, Thomas Byerley; member of Bath & West of England Society for Encouragement of Agriculture, Arts, Manufactures, and Commerce; corresponded with Sir Joseph Banks on ceramic colourings; a Proprietor of the Royal Institution; first MP for Stoke-on-Trent, 1832.

WEDGWOOD, Thomas (1771-1805). The first photographer; younger son of Josiah Wedgwood I. Compelled through ill-health to abandon profession of potter; published researches on heat and light, 1791-92; patron of St Coleridge, 1796; invented process of obtaining copies of objects by action of light on paper sensitized by nitrate of soda, 1802.

WESTON, Ambrose. Solicitor to Boulton & Watt and acted for them in the patent disputes of the 1790s.

WHITBREAD, Samuel (d. 1796). One of the largest common brewers of London, and among the first and most prominent customers for Watt's rotative engines.

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WILKINSON, William (1744/5-1808). Ironmaster, in partnership with John Wilkinson at Bersham, with whom he fell out, 1794; close friend of M.R. Boulton and James Watt jnr.

WILSON, Alexander (1714-86). Professor of Astronomy at Glasgow University; MA, St Andrews, 1733; worked as assistant to surgeon and apothecary in London, 1737-39; set up type-foundry at St Andrews, 1742; removed it to Camlachie nr Glasgow, 1744; first professor of practical astronomy at Glasgow, 1760-84; hon MD, St Andrews, 1763; original FRS, Edinburgh.

WILSON, Patrick. Succeeded his father, Dr Alexander Wilson, as professor of astronomy at Glasgow University, 1784.

WITHERING, William (1741-99). Physician, botanist and mineralogist. MD, Edinburgh, 1766; chief physician to Birmingham General Hospital, 1775; FRS 1785; published A botanical arrangement of all vegetables naturally growing in Great Britain, 1776 and other works, including an account of the foxglove, 1785, which he did much to introduce into the pharmacopoeia. His son, William Withering jnr studied medicine at Edinburgh from 1796-99 but did not complete his studies following his father's death, and devoted the intellectual energies of a gentlemanly life to editing successive editions of his father's works. He was a great friend of Gregory Watt.

WYATT, Samuel (1737-1807). Architect; elder brother of the more famous James Wyatt; born at Weeford (Staffs); worked extensively in the Midlands, developing a distinctive neo-classical style; built Heathfield Hall for James Watt and altered Soho House for Matthew Boulton, also built Albion Mill in London (Boulton's showpiece steam-powered corn mill).

WYKE, John (1729-87). Clock and tool maker, of Prescot (Lancs) and Liverpool. Invented a wheel-cutting engine and became well-known as a manufacturer not only of watches and clocks but also tools for this and other trades. He supplied Watt with tools from 1760 and later also Boulton & Watt (engine counters) and Josiah Wedgwood (tools and lathes).

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| C4/C13 | 42 | 101 |
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| C4/C17 | 42 | 101 |
| C4/C18 | 42 | 100 |
| C4/C18A | 48 | 107 |
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| C4/D19 | 43 | 102 |
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| C4/D24 | 42 | 101 |
| C4/D25 | 42 | 100 |
| C4/D26 | 43 | 102 |
| C4/D27 | 38 | 87 |
| C4/D28 | 42 | 100 |
| C4/D29 | 38 | 87 |
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| C4/D32 | 51 | 109 |
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| 3/45 | 34 | 77 |
| 3/46 | 42 | 100 |
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| 3/49 | 41 | 99 |
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| 4/30 | 22 | 67 |
| 4/31 | 35 | 81 |
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| 4/35 | 19 | 50 |
| 4/36 | 15 | 45 |
| 4/37 | 18 | 49 |
| 4/38 | 37 | 83 |
| 4/39 | 13 | 41 |
| 4/40 | 14 | 44 |
| 4/41 | 12 | 41 |
| 4/42 | 22 | 67 |
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| 4/44 | 16 | 46 |
| 4/45 | 25 | 70 |
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| 4/48 | 17 | 47 |
| 4/49 | 15 | 46 |
| 4/50 | 13 | 43 |
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| 4/52 | 34 | 78 |
| 4/53 | 35 | 80 |
| 4/54 | 26 | 71 |
| 4/55 | 32 | 74 |
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| 4/57 | 12 | 40 |
| 4/58 | 33 | 76 |
| 4/59 | 13 | 41 |
| 4/60 | 1 | 35 |
| 4/61 | 24 | 70 |
| 4/62 | 14 | 44 |
| 4/63 | 19 | 50 |
| 4/64 | 19 | 51 |
| 4/65 | 21 | 64 |
| 4/66 | 20 | 53 |
| 4/67 | 18 | 49 |
| 4/68 | 3 | 37 |
| 4/69 | 36 | 82 |
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| 4/83 | 41 | 100 |
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| 6/20 | 26 | 71 |
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| 6/60 | 49 | 107 |
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