

Fig. 23. 13 Lincoln's Inn Fields. First-floor plan, dated 30 July 1812 (by courtesy of the Trustees of Sir John Soane's Museum).

lower office and the museum was heated by stove. This heating arrangement would function well given each room's use, occupancy pattern, and character. Two bids for steam systems in 1820, from J. Garland on 1 June and from W. S. D. Bailey on 11 July, reveal, however, that Soane's thoughts were turning to central systems, in possible anticipation of the office-museum transformation that was soon to occur. These were extensive proposals to heat the entire rear portion of number 13. The Garland estimate was for a system costing £200 to heat the stair, office, picture room, library, study and dressing room, breakfast room, and museum. Rooms are not itemized in Bailey's proposal, but as his estimate was for £185, the scope was probably similar to that of Garland's bid.

Neither the Garland nor the Bailey steam system was installed. Instead, Soane commissioned less-extensive systems in 1820 and 1821. On 31 October 1820, the journal entry reads, "Paid Mr.

eral significant changes in the teens and early twenties. The lower office was transformed into an extension of the tribune. Above it, Soane designed a new studio." This interpretation is correct, but her commentary leaps from 1818 to the Gandy drawings of 1822, without considering that more significant changes were most likely made in the early 1820s. The plans of 1821, Figs. 24 and 25, are neither considered nor reproduced in the book. Millenson notes that Soane purchased sixty-four casts and twenty-three marbles at the Adam sale that year. See Millenson, *Soane Museum*, 59–62, 78. A. Bolton, *The Architecture of Robert and James Adam*, 2 vols., London, 1922, II, 329, notes the objects Soane bought and the sale date of 20–22 May 1818, after the February bills, suggesting problems with the interpretation that the office was altered to receive sale purchases.

Meckley for steam apparatus for warming offices at 13 L.I.F. £70." He abandoned this system within five months, however, in favor of another system. On 2 April 1821, he "paid Mr. Summers for warming offices." The system is described as a warm air stove "consisting of strong wrought iron cockle with large mouth piece fitted up with door and ashpit—register strong cast lining to cockle furnace bars and bearers in cast frame—strong flue pieces one brass and two iron—ventilators cold air grating with rack and flap and iron pipe for warm air flues, building the same in firestone with brick flues lined with lead . . . £80." Although it heated only the offices, this new heating system's cost was nearly half that of Garland's estimate for a system that would have fully heated the office-museum, suggesting that Summers's system was a sophisticated, or at least expensive, installation.<sup>58</sup>

The hot air system Soane installed was altered and expanded—or even replaced—between 1821 and 1825, years of considerable change to the professional spaces. A Cutler and Sons bill for 1822 and 1823 encompasses, in part, "83 feet of 6 inch iron pipe." They billed for work in June 1824 for ventilators, pipes, pokers, and dampers, among other things. Another document, "respecting the cost of hot air stove executed at 13 LIF under Mr. Watson's directions," contains "account of men's time in setting of hot air stove 1823 and 24." This might be related to William Feetham's "warm air stove to fit museum fireplace," for which Soane paid £27.7.0 on 16 June 1824.<sup>59</sup> The bill reveals that this stove was for the Monk's parlor—the room below the picture room—so evidently it was an extension of the heating system to encompass the new rooms built in 1824. May and Morrill were paid £116.12.4 for general alteration and repair on the heating system from March to September 1824. Clearly, the large payment indicated that this was extensive work, possibly integrating the existing system with remodeled spaces.

The office-museum underwent a radical transformation in the first half of the 1820s. The result of the evolution is well documented, but the intermediate stages are less clear. There seem to have been two distinct building phases in this five-year span. In the first, Soane reworked the upper and lower offices and built new stairs between the floors (Figs. 24 and 25). In the second, he built the picture room and colonnade and removed the wall separating the museum and offices (Fig. 26). The net

58. The total bill, for £96.7.6, continues with other items, such as "cast iron register stove for housekeepers room, altering hot air flue and carrying to another part of the office with 20 feet of new pipe, air box and iron grating." The housekeeper's room is likely a space beneath the breakfast room.

59. Watson apparently was associated with Feetham's firm. Bricklayer bills of 1824 support work on the heating system. Bills from Jan. to July 1824 refer to "fixing hot air stoves" and "cutting brickwork for pipes" in the new picture room and "taking down hot air stove" and cutting and patching bricks in the office. A 30 Jan. bill refers to "pulling down hot air stove and clearing away and wall to do."

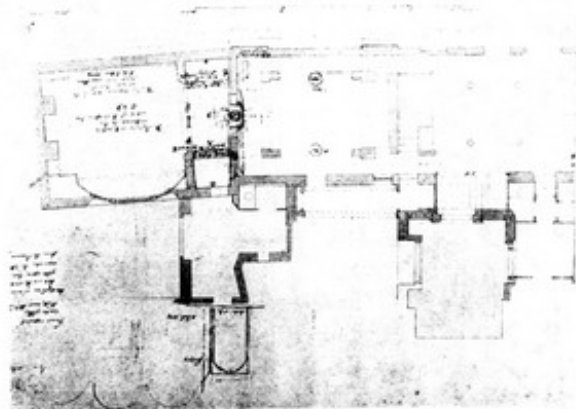


Fig. 24. 12–13 Lincoln's Inn Fields. Ground-floor plan of office, museum, and picture room behind 13 Lincoln's Inn Fields, dated 23 January 1821 (by courtesy of the Trustees of Sir John Soane's Museum).

effect of the work was that the upper and lower offices were no longer rooms, but meshed with the museum. Only at this time were the office and museum given their Piranesian form. Soane's interest in the central steam systems in 1820 is a prelude to the radical transformations of the first half of the 1820s, changes that Soane knew could be practicable only if heated by an extensive central system.

The first phase of building was from 1820 to 1822. Soane paid £174.16.8 on 5 August 1820 for work done in the office-museum. Meckley's steam apparatus was probably installed in the course of this work. Bills reveal that Summers must have installed a hot air system simultaneously with construction work for which Soane paid £520 on 25 April 1821. Exactly one year later, on 25 April 1822, Soane paid an additional £130 for work done at number 13. This series of payments over the course of a year and a half indicates that Soane was engaged in an ongoing project to reshape the office. Two plans reveal the changes. The first, dated 23 January 1821, might have served as the guide for the work paid for in April 1821 (Fig. 24). The second, dated 29 November 1821, must survey the work as completed or suggest changes that Soane was to pay for in April 1822 (Fig. 25). The plans differ in their stair and column arrangements, but the common elements shared by both, notably the wall between office and museum, indicate the office was still essentially a room. An extensive central system to heat both office and museum was not yet needed.

In spite of these two plans, it is not known exactly what Soane did in the office-museum between 1820 and 1822. A painting by J. M. Gandy of work in progress, exhibited at the Royal Academy in 1822, presents six views of the professional rooms—the upper and lower offices, museum, and picture room—and a ground-floor plan of these spaces. This comprehensive look at Soane's intentions suggests, especially in the vignettes of the passageways, that Soane sought to open up the office to the

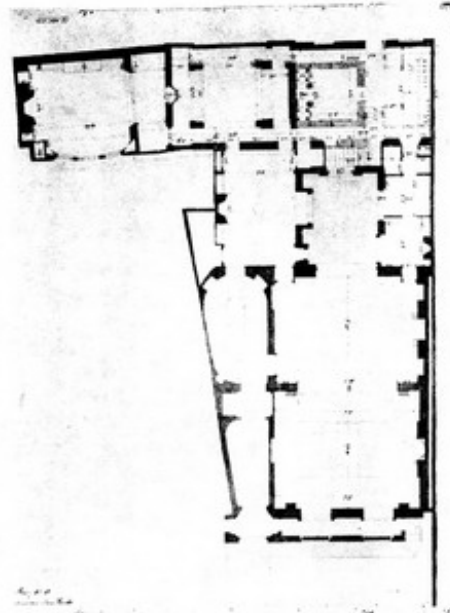


Fig. 25. 13 Lincoln's Inn Fields. Ground-floor plan, dated 29 November 1821 (by courtesy of the Trustees of Sir John Soane's Museum).

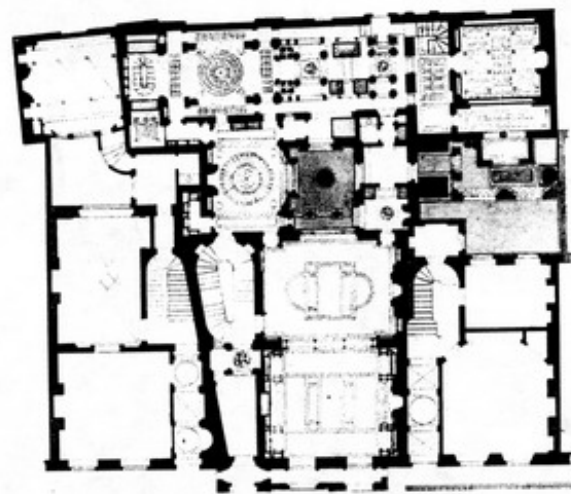


Fig. 26. 12–14 Lincoln's Inn Fields. Ground-floor plan. Drawing by C. J. Richardson, 1825 (by courtesy of the Trustees of Sir John Soane's Museum).

museum, creating long vistas along the north and south (Fig. 27). The view of the upper office reveals that it is essentially a drafting room (Fig. 28). The lower office, in contrast to its earlier manifestations, is less an office than a repository for Soane's growing collection (Fig. 29). It is filled with architectural objects displayed on shelves, cabinets, and interior partition walls. Several columns support the upper office, but there is not yet a colonnade.





Fig. 27. 12-14 Lincoln's Inn Fields. View of south passageway looking west and plan of office, museum, and picture room. Painting by J. M. Gandy, 1822 (by courtesy of the Trustees of Sir John Soane's Museum).

Gandy documented the residential rooms of number 13 in another painting, also executed in 1822. A ground-floor plan of the house on this painting provides a contrast with the plan found on the painting of the professional rooms. There is some discrepancy between these two Gandy plans in the amount of separation between office and museum, but in comparison with the two plans of 1821, it is clear that by 1822 Soane was at least considering opening up the wall between office and museum.<sup>60</sup> The vignette of the lower office is different from what

60. See *ibid.*, figs. 38, 39, 40, for reproductions of the Gandy drawings. Floor grills, like that in fig. 39, are commonly used in the Soane Museum for light penetration, not necessarily as part of any heating installation. The office-museum in both plans is similar to that found in Fig. 25, but with more opening in the dividing wall.



Fig. 28. 13 Lincoln's Inn Fields. View of upper office looking west. Painting by Gandy, 1822 (by courtesy of the Trustees of Sir John Soane's Museum).

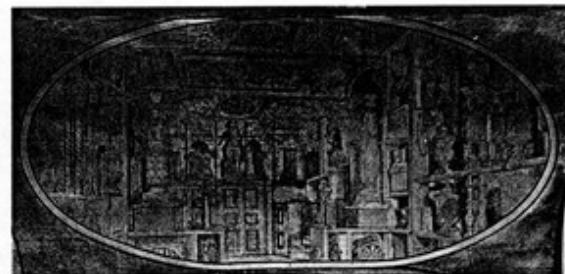


Fig. 29. 13 Lincoln's Inn Fields. View of lower office looking east. Painting by Gandy, 1822 (by courtesy of the Trustees of Sir John Soane's Museum).

exists today, indicating that further evolution took place (Fig. 29); but the upper office looks very similar to what was ultimately built, with a wood partition wall on its west side, provided with an opening through to the museum (Fig. 28). The drawing suggests that the museum is now visible from the upper office. Unfortunately, the more common view of the dividing wall's west side (for example, Fig. 20) was not shown in any of Gandy's vignettes, so it is not known whether openings were simply punched through or whether the wall was removed. Soane possibly faced indecision at this point in the renovation and therefore did not have it rendered. Alternatively, the con-



struction work might not have included any substantial work on the wall. The many museum sections drawn through the 1810s would make additional renderings redundant.

The second phase of building, culminating in 1824, finally reveals the complex, interlocking spaces now characteristic of 13 Lincoln's Inn Fields. Soane bought number 14 in 1823 and rebuilt it the next year. To number 13, he added the picture room behind number 14—the Feetham stove of 1824 heated these spaces—and made additional changes, transforming the lower office into the colonnade and walling off the old picture room to make it again part of number 12. The extensive May and Morrith alterations possibly meshed the existing heating system with the new construction. No working drawing of this construction survives, but the work was surveyed in 1825 when C. J. Richardson documented the building with plans and perspectives. In Richardson's museum perspective, it is possible for the first time to look from the museum right through into the colonnade and upper office, as the wall separating office and museum is gone (Fig. 30). Richardson's plan illustrates that the wall was removed and clearly shows the colonnade—the former lower office—open to the museum (Fig. 26). His drawings document the final stage of the lower office evolution, very different from its two early manifestations as an office and then a display area, both of which were separate from the museum.

If the offices were defined by four containing walls, they could be heated adequately by stoves or a central system that heated just the offices. Other adjacent spaces could have been heated when occupied. Despite an early, well-documented interest in central heating, Soane installed a comprehensive central system in the office-museum only when its spatial evolution reached the point where it would be unoccupiable without one. The spaces he envisioned and transformed in 1824 were practicable only if their heating strategy was reevaluated. The extensive work on the hot air system in 1824 reveals that Soane understood this well. Payments indicate that the office's heating system was expanded to encompass the museum and newly built picture room in conjunction with the spatial transformation of the office-museum.<sup>61</sup>

While no working drawings survive to document the hot air

61. Soane did not impose a technological solution on the space. Rather, he designed with central heating in mind, or central heating suggested new spatial possibilities to him. This is in contrast to Brueggemann's statement: "An excellent illustration of the use of environmental technology to solve design problems is John Soane house and museum. Here the architect, after trying a number of expedients, turned to the newly developed Perkins high pressure hot water system as the only way he could make his complex interlocking rooms comfortable without encumbering the spaces." See Brueggemann, "Central Heating," 154. The grounds upon which this statement appears to have been made, according to Brueggemann's notes, are Richardson's few comments in his *Popular Treatise* about the Perkins system and Soane's struggle to heat the space. More comprehensive research suggests that Soane did not simply "turn" to the Perkins system "to solve design problems."



Fig. 30. 13 Lincoln's Inn Fields. Perspective of museum, looking east and upward toward office. Painting by Richardson, 8 September 1825 (by courtesy of the Trustees of Sir John Soane's Museum).

system Soane used in the first half of the 1820s, sketches among his letters indicate the scope of the system he envisioned or built. An undated sheet (watermarked 1819) shows a plan and two elevations of a hot air heating system (Fig. 31). The drawings illustrate a hot air stove situated adjacent to the northwest corner of the monument court with pipes conveying heat to the offices, picture room, and main staircase. The duct orientation suggests that this heating system served the picture room that was behind number 12 between 1819 and 1824. As Soane moved the picture room to behind number 14 in 1824, these drawings reflect a system built or proposed between 1819 and 1824. They might be associated with Summers, although the system illustrated is more extensive than the one he installed in 1821, which apparently heated just the office.



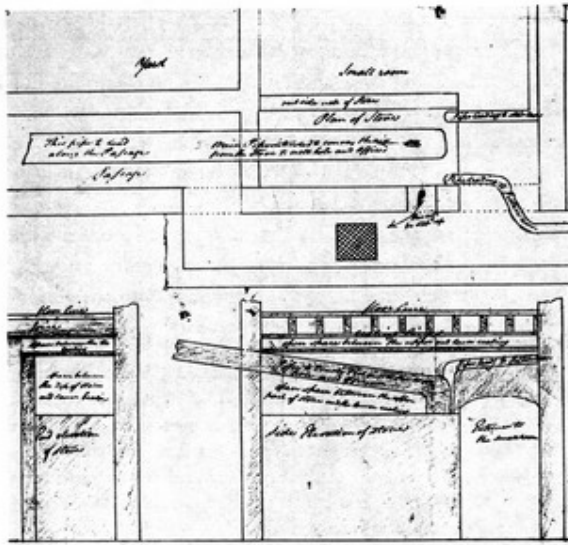


Fig. 31. 13 Lincoln's Inn Fields. Drawing of hot air heating system. In the plan, the "yard" is the northwest corner of the monument court. Watermarked 1819 (by courtesy of the Trustees of Sir John Soane's Museum).

Although 1825 bills for repair reveal that Soane's hot air system must not have functioned adequately, the principles behind it gained his favor.<sup>62</sup> In February 1826, he paid May and Morrill for "an improved calorific stove . . . for the purposes of warming the staircase, picture room, offices, museum, room under office and bedroom." The stove alone cost £82.0.5, and the total bill, with ventilating apparatus and other items, ran to £91.15.8. This installation was obviously not satisfactory, as a new system was soon considered. In a letter to Soane on 26 August 1826, Feetham proposed to heat the museum and picture gallery by a "warm air stove." Air would be conveyed to the gallery "by oblong copper flues 12 by 5" and "admitted" to the room by "brass trellis opening with door to regulate heat." Heat would enter the museum through "trellis openings with doors." The fire's combustion products would exit from "the same chimney that takes off smoke from the present stove." Correspondence indicates that this system was installed in September.<sup>63</sup>

In May 1828, there are records documenting the performance of Feetham's 1826 installation. A Mr. Wright inspected the "hot air stove and smoke pipes" concerning the problem of

62. He paid £30 to Cutler and Sons "for sundry work done for hot air stoves" on 22 Apr. and £7.10.6 to May and Morrill for hot air stove work done between 27 June and 30 Nov. 1825.

63. Payne writes to Soane on 12 and 14 Sept. saying the Feetham is working on the stove. On 18 Jan. 1827 there is a payment of £18 "for the hot air apparatus removed," presumably May and Morrill's. While Soane used central heating in the picture room, he also built a fireplace in the room.

"smoking." A plan signed by Feetham, Payne, Watson, and Wright outlines a proposal for modifying the system, estimating that removing the defects will take six weeks. There is also a written proposal from Feetham for altering the elbows and taking away part of the flue "to increase the draft." Soane evidently asked Wright to advise on the situation and later called in Feetham, the system installer. That same year, bills appear for a new heating system, so perhaps it was not worth the effort to alter the existing one. A July bill from Feetham is for a "new large warm air stove . . . in recess facing the stairs to warm the museum, Monk's room, picture gallery, and staircase. £261.14.6." Soane evidently purchased this or a similar system. On 20 November 1828 he paid Feetham £200 "for stove and apparatus to warm office, museum in full."

The problems in heating the professional spaces did not end with this installation. Soane paid Feetham £2.16.6 for work between January and November 1829, £42.4.2 for work in November and December 1829, and £-.16.0 for work in January 1830. The middle payment of £42, over one-fifth of the system's original cost, suggests that significant adjustments and/or alterations were necessary. The itemized November work appears extensive: "new hot air cylinder to convey the warm air, a new furnace front, 8 ft. of strong copper flue to take warm air from new stove to end of museum, taking down the copper warm air flue belonging to stove near Monk's room and refixing to take heat into museum. New stove in housekeepers room."

Some of the remedies were for naught. In Soane's notebook of 31 December 1829, he declared: "to complete the whole it now appears that all Watson's expensive operations in constructing the stove in the housekeepers room notwithstanding all his declarations and my blind credulity completely failed—thus finished the last day of the year 1829." In the next few days, he conducted tests of the system, encompassing fuel usage and temperatures achieved. "January 1st 1830. Feethams Stove, fire lighted 10 minutes past 9, contd until 5 o'clock, consumed 2 bushels of coke, good heat everywhere. Watsons stove, fire lighted ¼ past 9 cont. until 6 o'clock, consumed 3 bushels of coke—all the heat escaped up the chimney, mortar of the flu so hot. 3rd January. Sunday, ab: 10 o'clock: Staircase 52 to 53, the recess from breakfast room 53 to 54, Behind the Apollo 53 to 54, at the further end of the Museum 53, Breakfast Room about 55—all which places so Mr. Stanley considers as warm as they ought—this effect is provided from Feethams stove, there being no fire this day in Watsons stove."

While these tests might indicate that aspects of Feetham's system were working satisfactorily, Soane sought to replace it after only a few years. A letter dated 28 February 1831 from H. C. Price outlined a proposal to heat with hot water the library, breakfast room, museum, recesses and passages, clerks' office, picture room, Monk's parlor, and Monk's bedroom. Hot water, heated by a caldron and furnace placed in a recess ad-



joining the basement staircase, will keep the rooms at 60 degrees F. if it is 30 degrees outside. Soane's journal entry for 1 October 1831 indicates that Price was paid £150 "on account of hot water apparatus for warming museum."<sup>64</sup> From the sound of a letter Price wrote to Soane on 6 December 1831, the installation was not performing well in its first winter. In part, the letter reads:

Having called at your house, yesterday, and finding that Workmen were employed putting up further warming apparatuses; I consider it proper to transmit to you, a paper of agreement (with my Signature attached) which, by accident, has remained in my possession instead of yours.

At the same time, I beg to say, that altho' the promised temperature has not yet been provided in your Museum to by my Apparatus: I cannot admit, that it is inadequate to that object, until after I have had the opportunity, I have already stated to you would be necessary, of working my apparatus, for a few days, by my own people and under my own direction.

The system obviously did not match the standards set by Price in his February letter, thus the alterations.

Documents cast light on the Price letter and the removal of his system. December bills reveal work on chimneys, pipes, and taking down hot air stoves at number 13,<sup>65</sup> and a letter from Price dated 30 May 1832 indicates that the system was ultimately removed. Price had hoped that the affair had "been finally closed by the payment made on account and the return of the apparatus itself" until he received a note from Soane on 24 May. There is still a balance of £100, more than the value of the heating system's unreturned parts. Price simply requests "you will not insist on my rendering to you any further statement but agree to put this unhappy affair at rest for ever by allowing me to send you a receipt in full of all demands." With this

64. Bricklayers Henry and John Lee on 22 Feb. 1831 were "taking down hot air stove," possibly removing part of the old heating system in preparation for the Price system. On 5 March, they were "cutting out door for hot air stove" and 7 and 9 March "laying brick floor in cement to hot air stove." In Nov., Feetham removed the stove in the Monk's parlor.

65. The Lees on 2 Dec. 1831 were "taking down hot air stove." From 5 to 10 Dec. they were "taking down wall and sitting furnace, cutting mounts and building chimney to do." On 12 to 14 Dec. work involved "carrying up chimney . . . cutting out holes for pipes." William and Mark Feetham's account for 21 Dec. includes "taking down warm air stove in recess near Monk's room door . . . taking smoke flue out of the walls and removing horizontal smoke flue and warm air flue." This does not confirm the Price system was removed in Dec., for on 20 and 23 Mar. 1832, the Lees were "cutting away and making good brickwork, carrying up walls for paving after removal of boiler etc." Perhaps this was the system removal. A mason, Gundy, billed between Jan. 1831 and Apr. 1832 for "assisting to take down ventilating apparatus." Perhaps this refers to taking down the old heating system, before the Price installation in early 1831 or the removal of Price's apparatus. A basement plan dated 12 Nov. 1831 shows the position of the Price furnace, off the Monk's yard. A second basement plan dated 18 Nov. 1825 was evidently reused to show the circulation of a heating system, perhaps the Price installation.

correspondence, it is quite clear that the Price system was removed by late May 1832, if not earlier.

Soane replaced the Price apparatus with a high-pressure hot water system manufactured and installed by A. M. Perkins. There are no entries in Soane's journal or bills that exactly fix its costs or installation date, but the system was installed in 1832—when it appears in bill abstracts<sup>66</sup>—soon after Perkins's patent was granted in 1831. The primary source about the installation is C. J. Richardson's book advocating Perkins's heating systems, written because he was so impressed with the performance of the Perkins system in Soane's office:

During the time of my professional duties in Sir John Soane's office, I had opportunities (even without leaving it,) of studying the different systems of warming, all of which in their turn have been introduced in that building. . . . The perfect success of Mr. Perkins's system when introduced there, was one of the first circumstances that called my attention to the system, especially as I well remembered the miserable cold experienced in the office during former periods.<sup>67</sup>

Even though Soane installed central heating when he fused the

66. Various factors create this time frame. The Perkins system is mentioned in Soane's *Description* of 1835, but not in the *Description* of 1832. It is listed in abstracts of itemized bills of Mar. 1832 through 31 Dec. 1834 and 1 Jan. 1835 through 6 Oct. 1836. No payment for the system, however, is indicated. Other bills refer to work on it. On 12 Aug. 1833 the Lees were "taking down and resetting hot water furnace." In May 1834 they were "taking down and fixing hot water apparatus, cutting away brickwork and making drain under paving." On 23 June they were "taking down and altering flue of furnace at Monk's yard." On 2 June, they were "cutting away for and fixing warm air furnace," strange since one might assume these were removed. Perhaps two systems were in operation. Bolton, *Works of Soane*, 12, 68, states that Perkins's apparatus was installed in 1831, but this is not likely. The Price system was installed in the fall of 1831, and the Perkins system was patented only in that year as well. See SM, Division 15, K5, for a letter Perkins wrote on 17 Feb. 1836 in response to Soane's request to place some of the system's basement pipes in channels cut into the floor. Perkins argued against recessing the pipes. Not only would it be difficult to cut channels, but the pipes, an inch off the pavement, function better where air can more freely circulate around them. Soane evidently had concealed pipes or ducts in a similar manner. P. Thornton, Curator of the Soane Museum, noted "underfloor heating in the catacombs" in his article "Lit Up with Gorgeous Hues," *Country Life*, CLXXVIII, 19 Dec. 1985, 1978-1980. He has generously supplied the following information for this study: "When I took up some of the flagstones in the Crypt [the basement area underneath the breakfast room] I laid bare some shallow channels lined with stone (ie created with a broad flat slab as the base and with two shallow stone sidepieces, the lid being formed by the overlying flagstone). I could not see how these could have had to do with anything other than hot air or steam heating."

67. Richardson, *Popular Treatise*, vii-viii, 52. Richardson started working in Soane's office in 1824, only after the professional spaces were heated centrally. The "miserable cold" he experienced was due to the inadequacies of the central systems, not to the poor functioning of stoves. Richardson also wrote: "The kindness with which the late Sir John Soane was pleased to regard any attempt on my part to professional advancement, induced me to lay before him, a few weeks before his decease, the present treatise, and to explain to him my sentiments on the subject, which I have the gratification to know he essentially approved." *Ibid.*, 53.

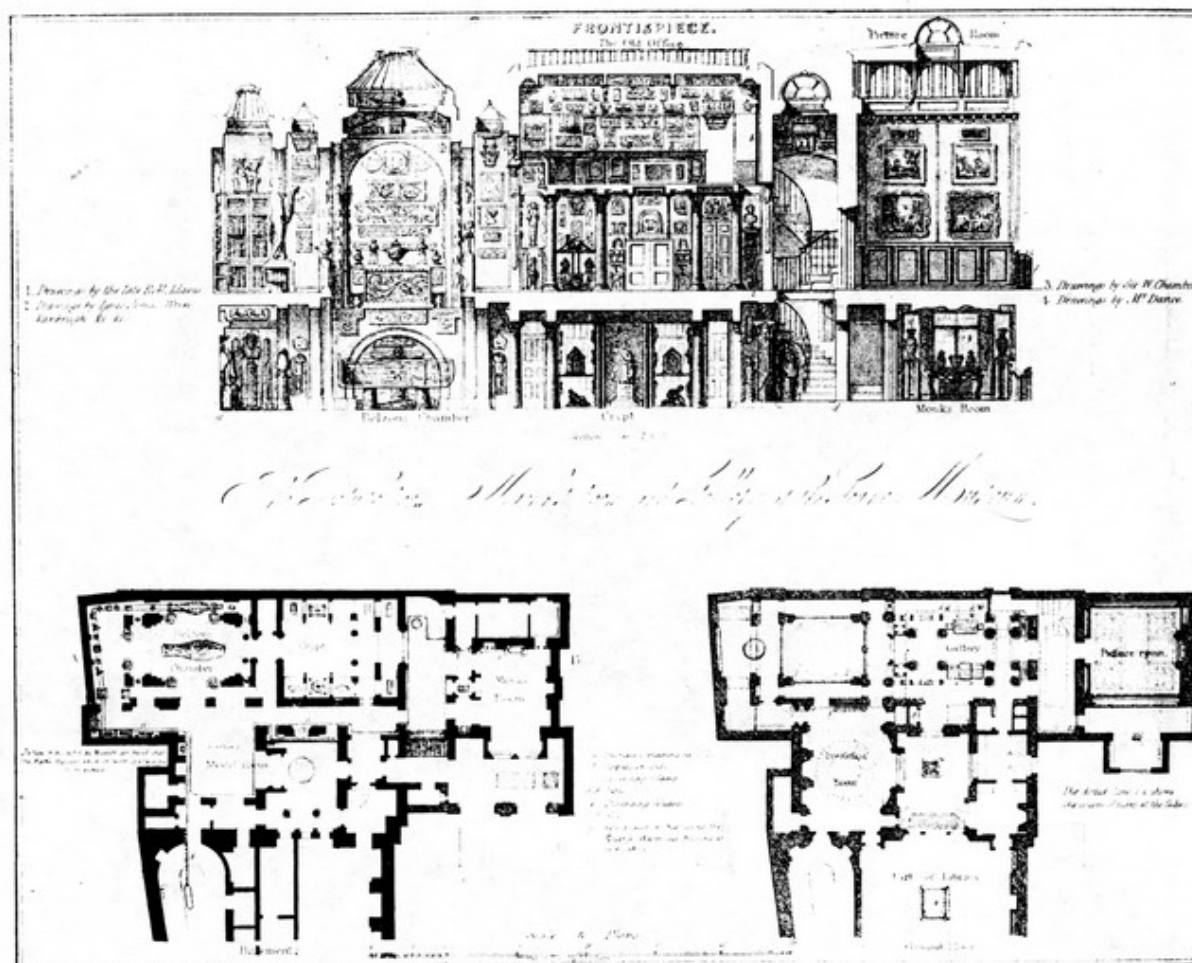


Fig. 32. 12–14 Lincoln's Inn Fields. Frontispiece from C. J. Richardson's *Popular Treatise* illustrating layout of the Perkins hot water system at 13 Lincoln's Inn Fields.

office and museum, in recognition that his unique spatial ideas were only practicable if heated centrally, the early systems never performed adequately. Perkins's system was the first that matched Soane's heating requirements.

Richardson's work contains a plate and written passage describing the layout of the Perkins system in Soane's office-museum (Fig. 32):

There are 1,200 feet of pipe in the Soane Museum. It is divided into two circulations; one of which warms the picture-room, and the two rooms beneath. The other, which has the largest circulation annexed to it, first warms the office in which the expansion and filling tubes are placed; the pipe then traverses the whole length of the Museum, then passes through the breakfast-room under the long skylight, intended to counteract the cooling effect of the glass; it then passes through the floor into the lower room, forms a coil of pipe of 100 feet in the staircase, and returns to the furnace, passing in its course twice round the lower part of the Museum; a coil from this circulation

is likewise placed in a box under the floor of the dressing-room, which, by an opening in the floor and the side of the box, admits a current of warm air into the room above.<sup>68</sup>

The great quantity of pipe appealed to Soane. The Perkins apparatus, Soane thought, "bore great resemblance to the contrivance of the brass tube called *Draco*, mentioned by Seneca as used in supplying the warm water in the *Piscina* of the *Thermae*."<sup>69</sup>

Soane framed the modern Perkins system in a historical context, aligning it with the classical tradition. Similarly, in Lecture 8, sandwiched between his comments on steam and hot water systems, Soane noted that "the general application of steam to

68. Richardson, *Popular Treatise*, 52–53. There is a more extensive description of the system in Perkins's own handwriting, dated Sept. 1835. See SM, XV.K uncat.

69. *Ibid.*, Dedication.



useful purposes has unquestionably been the work of the present age, but . . . its powers were not unknown to the ancients."<sup>70</sup> It was paramount for Soane to couch modern technologies in terms of the ancients and their knowledge. With this in mind, it is expected that Richardson would remark that Soane's "classical enthusiasm rendered him eager in the adoption of a plan which he considered to have sprung from our great masters, the Ancients, not doubting their acquaintance with that property of water (motion of its particles on the admission of caloric) upon which the apparatus in question is founded."<sup>71</sup>

It was important to Soane that he could find parallels between the Perkins system and ancient mechanisms. Others were simply interested in the apparatus's performance. When Soane was asked to evaluate Perkins's system for a prospective buyer, he gave it high praise in a dictated letter: "Sir John Soane has no hesitation acknowledging that the apparatus constructed by Mr. Perkins warms a portion of his house in a more satisfactory manner than any he has hitherto employed, and he has tried several."<sup>72</sup> Richardson's comments on the system's qualitative aspects indicate why Soane was so pleased:

The comfort and convenience of a moderate, warm, equalizing temperature can scarcely be understood or appreciated, without having been enjoyed. On entering from the open air, it may feel oppressive at a temperature of fifty-five or sixty degrees, but sitting quietly at sedentary occupations, no sensation is felt; we can move about without being aware that the winter snow is outside, and we are not annoyed by being only partially warmed on one side whilst we are chilled on the other.<sup>73</sup>

Richardson highlights the true breakthrough of central heating. Its ability to provide even heating directly addressed the problem typical of conventional fireplaces and stoves.

While Richardson and his contemporaries might have been content in rooms heated to 55 or 60 degrees, standards of com-

fort obviously have changed over time. The history of the Perkins system at 13 Lincoln's Inn Fields, however, illustrates its remarkable ability to meet different norms. Soane's assessment and recommendation of the systems and Richardson's interest in promoting them were proven to be appropriate. A new central heating system was installed at 13 Lincoln's Inn Fields in 1964, but Perkins's apparatus, with extensions in 1891 and 1911 and refurbishment in 1911, was in operation until that time.<sup>74</sup> Since Soane had installed steam heat in the office as well as two hot air systems and two hot water systems in the office-museum in approximately a dozen years, even he might have been surprised by the system's longevity.

The furnace's placement in the Monk's yard, Soane's satire of Gothic antiquarianism, certainly leads to the conclusion that Soane thought the Perkins system would soon be obsolete or replaced. The tombs of a fictitious monk, Padre Giovanni, and of Fanny, the Soane family dog, and various other ruins and relics are picturesquely arranged in the space. "Amongst these ruins is placed the furnace that heats the water by which the Museum and part of the basement storey of the House is warmed, by means of an ingenious apparatus, the contrivance of Mr. A. M. Perkins."<sup>75</sup> By juxtaposing the furnace with the sham relics, Soane acknowledged the failures of many heating installations and suggested uncertainty that the Perkins system would serve him any better.

#### *The residence at Lincoln's Inn Fields*

There is a radical difference between the spatial character of the professional portion and that of the residential portion of 13 Lincoln's Inn Fields. The office-museum, with its complex, layered spaces, was designed with the flexibility of central heating in mind, while the living quarters, simple square and rectangular rooms, were shaped by a fireplace's limited capacity to heat only its immediate surroundings. Though Soane was not literally able to ignore the constraints of fireplaces in the residential rooms, he could do so figuratively by addressing the nature of walls and containment. The spatial expansion and imprecise, multiple boundaries that Soane explored in the library and dining room date from their construction in 1812. These same issues became explicit in the office-museum renovation of the early 1820s. There, Soane used central heating to make practicable what was previously possible only in illusion.

While Soane innovatively utilized the capabilities of central heating, his exclusive use of fireplaces in the residential rooms, the domestic spaces in the front part of the house, reveal that the fireplace's psychological connotations were still compelling. Soane noted that the English, in contrast to the Romans who used central systems extensively, must "see the fire, or no degree

70. Soane, *Lectures*, 124. Soane then related an incident about an architect, Anthemius, who "had a dispute with his neighbor Zeno, relative to the walls, or windows of their contiguous houses. Anthemius, being unsuccessful in this dispute, retaliated on his antagonist by placing in a lower room of his own house several vessels filled with water, each of them covered by a tube of leather, which, being made wide at the bottom and gradually diminished to a narrow tube at the top, was artfully conveyed amongst the joints and rafters of the adjacent buildings. A fire being then kindled beneath the cauldron, the steam of the boiling water ascended through Zeno's house, which was shaken by the efforts of the imprisoned air, producing all the alarm attendant on an earthquake."

71. Richardson, *Popular Treatise*, Dedication.

72. The letter from Soane to G. D. Ryder was dated 25 Sept. 1835. SM, Division 15, K5.

73. Richardson, *Popular Treatise*, 52. Soane and family are shown in a painting of the breakfast room in number 12. They are around a table drawn close to the fireplace, where there is the most heat. The walls in a room certainly contain some heat, but it is best to sit near the fireplace or stove. Thus Richardson's complaint about uneven heating, being both warmed and chilled. See the image (SM, Dr. xiv.6.1) in Summerson, "Soane Museum," 26.

74. Bruegmann, "Central Heating," n. 49, citing letter of J. Summerson.

75. Soane, *Description*, 27.



of heat will satisfy." The "Romans were less anxious than ourselves to have the appearance of fire, provided they had the comfort of warmth." In a physical manifestation of these thoughts, Soane placed a symbolic flame on a stove in a Bank Stock Office study to make the stove visually warmer (Fig. 3). Soane used central heating extensively, but central systems could never replace fireplaces completely. For instance, steam heat could be used for "halls, galleries, corridors and such like parts of our houses."<sup>76</sup> Central systems were used in a residence's circulatory, utilitarian elements. He never suggested that central systems should be used exclusively throughout a residence. To Soane, and to his contemporaries, a room such as a library demanded the associations represented by a fireplace.

The hearth, a psychological element of domesticity, was an important, established component of English domestic life. Richardson wrote that a central system, like the Perkins apparatus, was "not intended to supersede the use of the English fireplace . . . but rather to *superadd* to its pleasant features the valuable properties in which it is deficient."<sup>77</sup> He did not recommend that the domestic fireplace should be supplanted by central heating; rather, both heating methods should be used in conjunction. As he wrote, the "cheering sight of a fire-place" can always be added to rooms centrally heated.<sup>78</sup> Tredgold also advocated that homeowners retain their hearths. "In dwelling houses it does not appear to be desirable" to apply central heat alone. Central heating is used to heat halls, corridors, and stairways, and it might be used to supply partially warmed air to the living areas; but the living, dining, and drawing rooms should be heated also by a fireplace.<sup>79</sup> Both authors discuss at length that fireplaces and central heating should be used together in homes, but, in contrast, they prefer central heating alone in nonresidential buildings. They do not imply that a combination of fireplaces and central heating should be used in public buildings, like schools or offices, further suggesting that the hearth was linked primarily with domestic life.<sup>80</sup>

Although Soane was not ready to part with the fireplace's psychological effect, his fireplaces are never the prominent elements they are in older English homes. This is perfectly illustrated in his work at Lincoln's Inn Fields. The fireplaces in

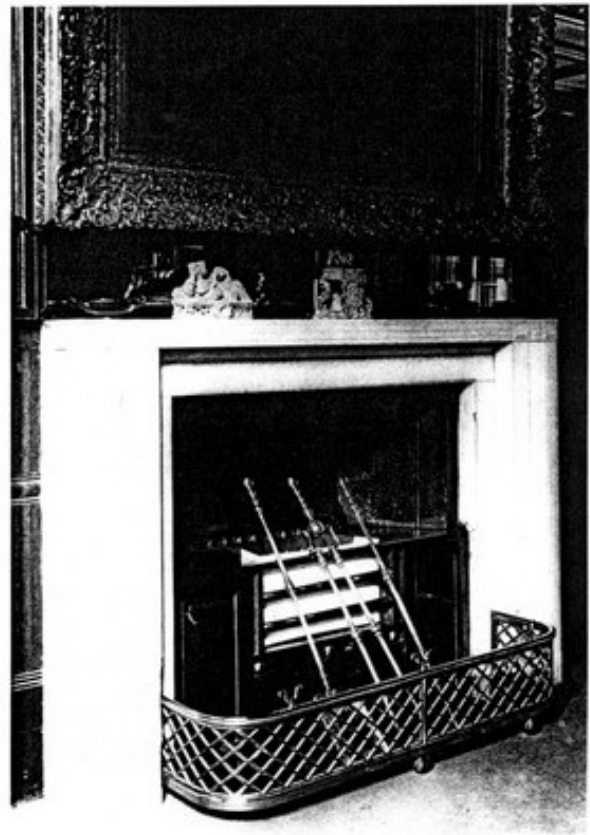


Fig. 33. 13 Lincoln's Inn Fields. Fireplace in dining room (by courtesy of the Trustees of Sir John Soane's Museum).

the original rowhouses were central, massive entities, literally a physical manifestation of the hearth as the heart of the English home.<sup>81</sup> In contrast to these heavy fireplaces at numbers 13 and 14, the fireplaces Soane built in 1792 at 12 Lincoln's Inn Fields are flat and discreetly integrated with the party wall (Fig. 9). In the succeeding years, when Soane bought numbers 13 and 14 and razed the existing structures so he could build anew, he moved their fireplaces to less prominent locations and gave them less pronounced articulation (Figs. 12 and 33). In elevation they are also quite flat, delicate, and decorative.

In the first half of the 1700s, architects preferred heavily articulated chimneypieces, accentuating their importance. The influence of the Adam brothers, however, was remarkable in shifting fashion toward a more delicate, less three-dimensional treatment.<sup>82</sup> Soane himself noted that their "light and fanciful

81. The homes were originally constructed in the 1650s. See *Survey of London*, III, London, 1912, 11, 23, 26.

82. P. du Prey, *John Soane: The Making of an Architect*, Chicago, 1982, 311. Also see N. Hills, *The English Fireplace*, London, 1985, 46–49, 52. Hills discusses the importance of Soane and Adam in the evolution of fireplace design.

76. Soane, *Lectures*, 123–124. Soane had few comments on chimneys, the word he uses for fireplaces, in his consideration of heating. He did note that wood had been largely replaced by coal as a fuel source.

77. Richardson, *Popular Treatise*, 14–15. In the first pages of his work, Richardson addresses fireplaces, particularly their early manifestations and inefficiency. He discusses the transition from wood to coal, and the "various and beautiful constructions in metal" developed to hold coal are notable. Fireplaces originally burned wood, but coal was the common fuel source in Soane's era. *Ibid.*, 9–10.

78. *Ibid.*, 72.

79. Tredgold, *Principles of Warming*, 158–159.

80. For instance, Richardson, *Popular Treatise*, 41–44, discusses the Register Office, where both the rotunda's hypocaust system and individual fireplaces in smaller offices were replaced by a Perkins system.



style" extended to both building and furniture until "everything was Adamitic."<sup>83</sup> As Soane's fireplaces exhibit the Adam influence, it is against their innovations that he must be judged. Adam fireplaces were designed to blend in with the brothers' flat, decorative motifs, but the precedents they appreciated must also be recognized. Their inspiration, Roman architecture, was a culture, as Soane noted in his historical overview of heating, without a strong fireplace tradition. The Romans were known for the central hypocaust systems, not their fireplaces.

As the Adams drew from Roman culture, it is natural that they would deemphasize the fireplace by integrating it with the wall instead of treating it like an object. The impact of new heating strategies might also have been an influence on Adam fireplaces. Robert Adam died in 1792 and James in 1794, obviously before the use of steam, hot water, and hot air systems became commonplace. They did, however, use the first type of central system—hypocaust heating. The central rotunda of the Edinburgh Register Office was heated by an under-floor hypocaust system in 1788.<sup>84</sup> This heating method would have given the benefits of central heating to building occupants and appealed to the Adams because of its Roman derivation. As the importance of fireplaces diminished with the introduction of new heating strategies, the Adams were able to experiment with their fireplaces, questioning the appropriateness of heavy fireplace designs.<sup>85</sup>

83. Soane, *Lectures*, 172. In Lecture 11, Soane paid tribute to Adam's genius. Summerson, *New Description*, appendix 1, notes that in 1833, Soane paid £200 to acquire fifty-two volumes of drawings by Robert and James Adam from the Adam family.

84. The Register Office was begun in 1774 and completed in 1792. See Richardson, *Popular Treatise*, 41, for discussion of the building's heating. The rotunda was "warmed by means of circuitous smoke flues, placed directly beneath the stone floor." This hypocaust system was "inefficient," and a Perkins system was later installed. Bolton, *Architecture of Adam*, II, 232, quotes from the building record of 8 Sept. 1788: "Four stoves to be built in the centre, round a cylinder of fire brick, covered with a plate of cast iron with proper flues below the pavement for warming the Dome." He adds that this is a "hot-air apparatus" and that "brass or cast-iron gratings were originally provided." J. Lees-Milne, *The Age of Adam*, London, 1947, 135, adds that "heat was to be emitted through vents in the floor, for which several designs are included in the portfolios of his working drawings and of which none seemed to have found favour." These comments, like Bolton's, suggest a hot air system. Perhaps no variation for vents "found favour" and a hypocaust system, like that mentioned by Richardson, was used.

85. The Adam contribution to heating is important, but they have received more credit than they deserve. A. Bolton's *Architecture of Adam*, I, 241, notes that at the Kedleston saloon, "the striking cast metal altars crowned by vases standing in the alcove were connected with the hot air scheme of heating employed by the Adams for these rotundas." T. E. Alasdair Barclay, Kedleston Hall Administrator, has kindly written that there was no hot air system. The altars are really stoves, which "would have provided heat by radiation." There is not even "evidence to connect Adam with them." The saloon was completed in 1765, but the stoves were installed only in the 1780s, when the room's decoration was completed. About Newby, in vol. II, 140, Bolton notes, "Evidently the gallery was warmed by some scheme of hot air, which found its

While Soane's fireplaces at Lincoln's Inn Fields were influenced by a shift in style and the impact of new heating methods, he still recognized their limited capacity to heat beyond the immediate surroundings. The walls and doors isolate the library and dining room from the rest of the house, containing the rooms so they trap their fireplaces' heat (Fig. 12). In the figurative sense, however, Soane did not accept the spatial limitations of fireplaces. He used mirrors and illusionary planes in the library and dining room to create spatial richness, breaking down the notion that four walls define a room (Fig. 34). Mirrors multiply images so the room has imprecise or even multiple boundaries. The hanging arches and metal spindles define secondary walls or planes in front of the real walls. Even the term *wall* is a misnomer because, in fact, many contain built-in bookshelves. When they are filled with books, the actual wall is never seen.<sup>86</sup>

There is precedent for the architectural devices that produce the library and dining room's unique effects. While Soane was in Italy (1778–1779) for studies sponsored by the Royal Academy, he visited the villa of the Prince of Palagonia near Palermo. The prince's delight in lining rooms and furnishings with mirrors was recalled by Soane when he wrote about his own house. Certainly, the villa influenced Soane's own use of mirrors, number 13. Soane also drew considerable inspiration from Angelo Campanella's series of colored engravings whose subject was Roman murals, discovered in ruins at the Villa Negroni, Rome.<sup>87</sup> The spatial expansion and multiple boundaries in the Campanella engravings, as well as their representation of architectural devices such as spindle columns, are suggestive of

way out through metal pedestals of Adam design, analogous to the means adopted in the rotundas at Kedleston and the Register House, Edinburgh." There is doubt of the accuracy of these comments about Newby and the Register Office. Perhaps following Bolton's lead, other commentators have made similar interpretations. Lees-Milne, *The Age of Adam*, 135, compares the heating at the Register office with "similar apparatuses to warm [Adam] domes at Newby and at Kedleston." For Kedleston, J. and A. Rykwert, *Robert and James Adam: The Men and the Style*, New York, 1985, 74, describe the "cast-iron triangular pedestal carrying vases, like antique altars, which are in fact the outlets of a hot air heating system of Adam's devising."

86. See J. Summerson, *Architecture in Britain 1530 to 1830*, Harmondsworth, 1953, 299–300. "In the library . . . there are hanging arches, Gothic-inspired, which 'detach' the ceiling from the walls; tall bookcases, inset with strips of mirror, stand beneath and beyond the arches, while above the bookcases, and remoter still, is a deep mirror frieze which, reflecting the whole ceiling, hints at yet further receding planes. It is impossible to say on which plane the actual wall exists; for all aesthetic purposes it is not there. Similarly, in the adjoining dining room, an ample window looks out into the Monument Court, furnished with fragments to be seen in relation to the vases and pots ranged on the broad cill inside the room, blurring the division between room and court."

87. Du Prey, *John Soane*, 119. In Soane, *Description*, 1830, 53, he notes "the wonderful performances of the Prince of Palagonia."

88. Summerson, *New Description*, 47; and J. Summerson, *Sir John*





Fig. 34. 12–14 Lincoln's Inn Fields. Library, seen from dining room (Richard Bryant photograph).

the explorations and vocabulary in the library and dining room.<sup>89</sup> By prominently displaying Campanella's work in the breakfast room, next door to the dining room, Soane clearly established a link between his architecture and its inspiration.

The library and dining room never went through the profound transformations of the office-museum, but their architectural form underwent some alterations. Soane expanded them figuratively by installing more mirrors over the years—adding

*Soane, 1753–1837*, London, 1952, 23. About 1777, not long after the ruin's discovery, Angelo Campanella published the engravings. P. du Prey, in conversation, indicated that in the course of his research, he found no evidence that Soane, during his Italian studies, visited the ruins at the Villa Negroni or saw those actual wall paintings. Millenson, *Soane's Museum*, 18, notes that Soane purchased a set of the engravings at a Christie sale in 1796. See fig. 11 in her work for an image of a Campanella engraving.

89. See Millenson, *Soane's Museum*, 18, 28. The engravings evidently did not profoundly influence number 12. Soane might not have been acquainted with them when he constructed number 12 in 1792. According to Millenson, "the interior planning and decoration [at number 12] were unremarkable with the exception of three decorative features." Those features, the ceiling with trompe l'oeil trellis and vines in the breakfast room (also called the library), the colored-glass circular skylights in the breakfast room, and the plaster cast display in the office passageway, were unique, but they were not related to the engravings. On the subject of the influence of art in Soane's architecture, Soane knew Piranesi from his time in Rome. The artist gave him four prints. Piranesi's influence can certainly be felt in the office-museum spaces. See *ibid.*, chap. 4, for more discussion.

to those originally present in 1812<sup>90</sup>—to augment themes established when the rooms were constructed. In 1834, a literal expansion took place when he moved the library's windows outward to capture the loggia. He commissioned ceiling paintings for the library and dining room that same year. When these were installed, Soane raised the arches separating the two rooms so the paintings could be seen simultaneously. He expanded the library by reducing its separation from the dining room. At this stage, he even wrote that the dining room and library "may be considered as one room."<sup>91</sup>

It is fitting that the ceiling paintings Soane commissioned comment on the issues of expansion and containment, themes he explored architecturally in the library and dining room. In the library, mythical figures linked with the heavens—Phoebus, Aurora, and the Morning Star—are represented. By associating the ceiling with the heavens, Soane figuratively expands the library. The subject of the dining room paintings is Pandora. Since her box holds the cares and miseries of life, this work is literally about containment.

90. The documentation for the library-dining room changes lies in descriptions published in the 1820s and 1830s. See the three editions of *Soane's Description* and J. Britton, *Union of Architecture, Painting, and Sculpture*, London, 1827, another description of the residence. The different drawings in these books show that mirrors were added over time.

91. Soane, *Description*, 5.