

Three Doors to Other Worlds

Architecture that is hard to describe by being immaterial, irrelevant, and unintended may engage us in a narrative rather than a visual sense. Three examples of anonymous architecture are presented where stories regarding interfaces between existence and nonexistence emerge. They are all places where people can vanish and taken together tell stories of death, hell, and heaven. In these unexpected places, the deeper issues of life may be obliquely and ironically experienced.

Of darkness visible so much be lent,
As half to show, half veil the deep intent.
—Alexander Pope¹

Introduction

Is it possible to find architectural objects that are so difficult to describe that they resist being represented by photograph or measured drawing? To be more exact about what we mean by description, let us restrict ourselves to Aristotle's four types of cause—material, formal, efficient, and final—and look for things for which those causes are an inadequate explanation. If there is obviously more to an object than the stuff from which it is made, it will be immaterial in the primary sense of that word. It will be immaterial in the secondary sense of that word, meaning irrelevant, if it lacks a formal or a final cause through being purposeless or useless. It will avoid having an efficient cause if it has an unknown origin or if it is the unintended result of an accidental or unconscious process.

Examples of objects that evade description in this way follow. How can we interact with such negative objects? If we do not dismiss them as irrelevant and unimportant, then I suggest that we will interact with them by reading stories into them, providing by default a teleological explanation when other descriptions fail. In other words, if the object avoids a material, formal, efficient or final cause, we will project a meaning on to it from within ourselves. The themes that emerge are those of lyric poetry, namely love and death. The results may be

sublime, spiritual, or comic, and the better the object is at avoiding description, the richer they are.

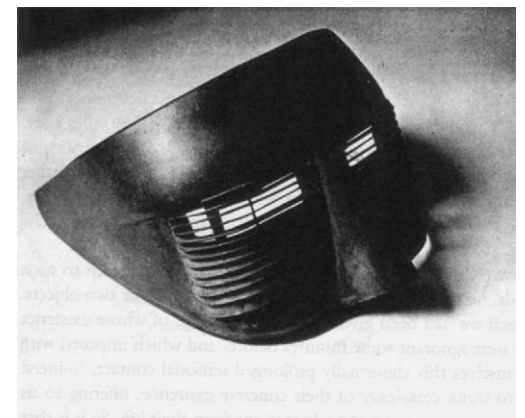
Hard-to-describe objects are hard to find because there seem to be no rules for recognizing them. They are discovered rather than invented. If a way of making them were to be found, we would have an efficient cause for them, one of the very things we wish to avoid. To some degree, they seem outside our control. They are not available to us as objects to be used; instead, our relationship to them is more personal. The idea of hard-to-describe everyday objects taking part in a dialogue can be found in the work of André Breton. It will be useful to review his experience with indefinable objects before looking for architectural equivalents.

Indefinable Objects

In 1934, André Breton and his friend Alberto Giacometti selected objects at the Saint-Ouen Flea Market in Paris because they were "drawing us as something we had *never seen*."² He reproduced photographs of the mask (Figure 1) and the peculiar spoon they bought in his book *L'Amour fou* (Mad Love). These *objets trouvés* were hard to describe because they resembled a lot of other objects simultaneously so that no single category seemed sufficient to cover them. Breton's first impression of the mask was that of "being in the presence of a highly evolved descendant of the helmet, letting itself be drawn into a flirtation with the velvet mask."³ Speculating unsuccessfully on what they might actually be, Breton uncovered

uncanny connections between them and obstacles in his work that were thereby overcome. The mask reappeared in the face of one of Giacometti's sculptures, and the spoon was found to contain a concealed image that was artfully photographed by Man Ray. Breton wrote, "*The finding of an object serves here exactly the same purpose as the dream.*"⁴ One feels a little envious that such magical goods cannot be found in secondhand shops today, unless perhaps they are still there but we lack his gift for seeing them. This is certainly possible for there seems to be no method for finding objects like them. Indeed, Breton was at pains to describe how they nearly did not buy the objects, which were after all only bric-a-brac, and that they walked away from the stall before having second thoughts and to that extent the purchase

1. André Breton's mask. (Photograph by Man Ray.)



was unintended. It took several days for their hidden aspects to emerge.⁵

Breton's encounter may be described as sublime, something that is experienced when there is a difference between what is seen and what is felt. Breton sought out such experiences. Some of his most characteristic essays describe the ways in which chance events link inner human desire with the outward world. Although sublimity is most often experienced in powerful and overwhelming circumstances there are other ways of evoking it, as we see here. In literature, there seem to be no rhetorical figures for it; indeed, it has been said that sublimity is most effective when whatever figure happens to be used is not explicit.⁶ In short, there is no recipe for these effects, and if you think you have one, it may not stand up to scrutiny. Edmund Burke located it in obscurity and for that reason thought that a painting that clearly represented its subject can only ever be beautiful and never sublime.⁷ Some of Burke's best examples of sublimity are from Milton, for whom words were the exemplary sublime medium precisely because they do not provide clear images. In poetry, the reader contributes to the picture; in the same way, Breton contributed to what the objects were when he involved them in his work.

Narrative Architecture

Evidence that being hard to describe and having narrative quality go together is found in townscape and landscape. Thomas Sharp, who coined the expression, described townscape as something seen by the kinetic eye and illustrated it with sequences of photographs in preference to single images.⁸ Gordon Cullen represented it with photographs and drawings presented like a comic strip or a storyboard in which we can see movement and drama in close-up and long shot.⁹ Because we perceive townscape in a narrative rather than visual sense, a novel can be set in a town, although it would be odd to set one in a building. In



consequence, townscape is hard to draw, and attempts to go beyond plan drawings can lead to peculiar results. Thomas Sharp's drawings of his proposals for Exeter (Figure 2) avoid indicating the style of particular buildings.¹⁰ The result is almost uncanny, a city of strange white buildings that are like a canvas onto which an architect is going to paint. The essence of townscape is difficult to represent in individual drawings because time and space are needed to involve the viewer. Landscape can be immaterial in much the same way. Caroline Constant describes how at Gunnar Asplund and Sigurd Lewerentz's Woodland Cemetery the landscape was designed to resist a definitive analysis in historic terms by suppressing overt symbolism in support of the ineffable and the imagined.¹¹ A lack of clarity allows us to project our own meanings onto the scene. A similar obscurity improves the photograph in Figure 3, taken through a spy hole in the locked doors of Lewerentz's Resurrection Chapel. It is a poignant image because we can picture ourselves peeping into the light-filled chamber where the living and the dead part company. The photograph is accidental and incomplete but involves us imaginatively. Because it both hides and reveals its subject, it is more powerful than the usual photograph in which the chapel is seen through open doors.¹²

Three examples of architecture follow that engage the viewer in a similar way through being

hard to describe and through concealing something. They are not buildings as such but objects in landscapes that avoid description by being immaterial, irrelevant, and unintentional. As with Breton's objects and as with townscape, we respond to them personally if we, literally and figuratively, take time to look around them and engage with the stories they tell. All of them have dramatic potential and would make good film sets.

The Black Arrow

Until recently, a black triangle could be seen at the entrance to Asbestos House, an office building in downtown Manchester, England.¹³ Between 1959, when it was built, and its demolition forty years later, few who stepped over it would have given it a second look. Its photograph (Figure 4) draws attention to something that, when pointed out, many people find slightly odd. It seems that the builder constructed an arrow drawn on the plan that pointed to the entrance. The result was a sort of cultural fossil, a representation inlaid in terrazzo of a hugely enlarged piece of *Letraset*.¹⁴ Since it was copied from an eighth-inch-to-one-foot scale drawing, it was built ninety-six times larger than its prototype, resulting in something like a spontaneous Claes Oldenburg oversized sculpture. Precisely how this happened is unknown. Perhaps the work was so absorbing that the contractor got carried away. It could even have been malicious; one can



3. Lewerentz's Resurrection Chapel. (Photograph by Sally Stone, 2006.)

easily imagine the builder getting revenge after being told by the architect to just build it like the damned drawings. (In those days, relations between builder and architect were often confrontational.) It is unlikely that it appeared as an item in the contract. Nobody designed it, nobody paid for it, and the person who built it was probably unaware that they had done so. It lacks a clear material, formal, efficient, or final cause.

The location of the entrance is not always obvious in plans of modern buildings, and architects sometimes indicate it with an arrow. How should such a symbol be drawn? Typographers use the expression "the invisibility of type," reflecting the fact that when we read, we see words and not letters.¹⁵ Typefaces are designed to vanish; by sharing features with each other, letters are camouflaged within the text. In a similar fashion, a symbol does well to blend in with its surround-

ings so that it does not stand out as an object in its own right. In this case, the black arrow appropriated the modernist language of the building by being abstract and geometrically simple. In fact, it was so well camouflaged that it vanished into the background and was mistaken for a decorative motif, allowing it, like a parasite, to switch hosts by incarnating itself in stone. Could there have been a third stage in its life cycle through the subliminal influence it had on visitors? Anything written in stone has a kind of atavistic authority, and had it appeared in a novel or a film, its meaning would have been obvious. As long as a visitor knew the story of the black arrow, then they were its master, but if they were unaware of it, then the black thing had a chance to speak. Suppose they intuited that it was an arrow and then dismissed the idea as silly, they were still left with the question: "why did that thought occur to me just now?" A black arrow resembling a pyramid that manifested itself for a moment before vanishing could represent a premonition of death. The fact that it pointed to the door of an Armed Forces Careers Information Office will only have served some visitors as a macabre confirmation of what it seemed to say.

The Black Hole

The next example is so rich in multiple meanings and connections to literature and myth that it is easy to overlook its obvious purpose and see instead an object of sinister artistry. The Ladybower reservoir, located in Derbyshire, England, and built between 1935 and 1944, lies behind an earth dam designed by engineers G.P. Hill and Sons of Manchester. No architect was involved in its creation. The dam is protected by a pair of overflows whose stone bellmouths are eighty feet in diameter (Figure 5). These colossal orifices illustrate almost every one of the qualities Edmund Burke lists as necessary for sublimity such as terror, great dimension, unity, and the artificial infinite.¹⁶ The elemental cylindrical shape and stonework at

a not-quite-human scale match John Ruskin's criteria (outlined in *The Seven Lamps of Architecture*) for expressing power.¹⁷ Notwithstanding the obvious beauty of the design, a description of the project published in 1939 portrayed the works in entirely pragmatic terms as efficient, economical, and easy to build, aims that were unlikely to have changed as work on this important industrial project continued during the war.¹⁸ Indeed, its sublimity seems to have been enhanced by the ruthless economy with which it was executed. For example, as will be explained shortly, its stepped form improves it as an object that we can interact with imaginatively. Stone bellmouths like these would normally have been dressed smooth, but here, the stone courses were left in steps to save time and money. This change was sufficiently unusual to warrant testing by Professor Gibson at Manchester University whose scale models proved that the stone funnels were more than equal to their task of swallowing a river.¹⁹

What is down that hole is a deep mystery. Not even Google Earth can help you since its depths are in shadow when photographed from above. To see for yourself means going down the steps as far as you dare and then leaning out to take a look. Before attempting a descent, you might think it prudent to walk around the hole looking for the easiest way down. The search will reveal that the workmanship is superb and that there is no weakness to exploit, nowhere to tie a rope and not so much as a pebble to throw down the hole unless you brought it with you in the boat. The steps of this circular waterfall are all eighteen inches high. This is an awkward height to descend, and most people, one imagines, would soon turn their back on the hole and face the stone like a climber. How far would you be willing to go before the steps became too small to continue? With proper boots, it is possible to stand on a sharp edge as narrow as a quarter of an inch wide; in such a position, you will risk your life twisting your cheek away from the stone to look downward because that movement



4. The entrance to Asbestos House photographed in 1994. (Photo by author.)

will shift your center of gravity from a position above your feet, causing you to pivot away from the wall with only friction at your fingertips to hold you in place. Sooner or later, either your nerves or your grip will fail while diminishing steps accumulate below preventing a vertical view. In short, as if you were performing a ritual, this structure will first make you walk in circles, then make you turn your back on the thing you fear, then give you a severe fright, and then deny you the answer to a question any bird could solve in a moment. When you do fall, you will hit the sides before hitting the bottom. Death with time to think about it arriving awaits anyone who peers too far into that hole.²⁰

What we have here is a geometrical oddity: an edge over which it is impossible to look.²¹ Because you can see the endless walls of the abyss both below you and facing you, nothing is hidden except what is down the hole. Standing on the rim, you are very close to a mystery: a space receiving the light of the sun into which we cannot see. In no particular order, let us count some of the ways it can be described.

(1) It resembles a black hole, a darkness that is fatal to approach and beyond which nothing can be known. The diminishing rings of stone speak of the compression of space as the event horizon is approached.²² (2) The curve on the top ring makes

a graceful contrast to the steps so that the whole piece is like an architrave framing the abyss, a sideways portrait of darkness visible. (3) As a dome is a rotated arch, this is a staircase in rotation, a Devil's Staircase.²³ (4) Eighteen inches may be too large for a stair riser but is comfortable for sitting, creating a sort of amphitheater of the void, a satanic theater in the round (although one would not want a front row seat). (5) It is between the "Devil and the Deep Blue Sea."²⁴ (6) It is a hole down which a plumb line cannot be dropped: a bottomless pit. (7) It is a stone whirlpool. (8) It is an Island of the Dead. (9) Here is the source of one of the rivers of hell. (10) Its diminishing circles remind us of Dante's model of hell. (11) This is what Columbus' crew feared: the edge. (12) The top is large enough to ride around on a bicycle but is useless for any healthy human activity. You could play games of dare, but little else. A more dangerous place to play cricket could not be imagined; no game of Frisbee would last long. (13) It is a negative reversed object: a cylinder of air going into water. (14) The hole has dramatic potential; one thinks of several Hitchcock films where the villain goes slowly over the edge, it is not hard to imagine that scene repeated here. (15) It is perhaps not quite as extreme as H.P. Lovecraft's nightmare city of R'lyeh whose cyclopean non-Euclidean masonry rises from the ocean floor, but it might pass for it in a low-budget film.²⁵ (16) During the past war, this mock-satanic object was subject to attacks by the Royal Air Force, who practiced dropping bouncing bombs on it.²⁶ (17) Yet its solidity may be an illusion; geologically speaking, dams are transient. Abandoned without maintenance, the dam would probably fail in as little as a century through overflow erosion after opportunistic trees block the bellmouths.²⁷ (18) It flows with water only rarely and most of the time is as inert and useless as Dante's Satan frozen at the center of the earth. (19) It is not even unique; the dam has a pair of them. Either one of them is redundant and so if one were to vanish, probably

nothing bad would happen, and in a Twenty Questions quiz, you would have to waste one of your questions finding out if it was the left or right overflow. And so we could go on. This bellmouth and its hole is a fountain of invention and stories.

Yet for all its power, it is very nearly ridiculous; a section drawn through it looks like a plumbing fixture.²⁸ Photographs are more impressive, especially the one by Peter Byrne shown here in which a boat and tiny figures give it scale. Looking at that photograph, I think the man walking on the top will need a bigger stick than that if he is to unblock it on his own. You can laugh at that photograph, but the laughter would die on your lips if you could turn from the image to look at the original. To that extent, it escapes representation, and in the difference between what is seen and felt, we feel the touch of the sublime. What it speaks of, the dark matter around which all these ideas orbit, seems plain enough. No arrow is needed here.

Upstairs and Downstairs

Unlike the previous two examples that are morbidly enlarged versions of familiar prototypes, the third example exists only as an idea on paper. It is a plan of a house taken from J.-F. Blondel's collection of 1737, *De la distribution des maisons de plaisance* (Figure 6).²⁹ Plaisance refers to the owner's taste, not to any other sort of pleasure; distribution is used in its Vitruvian sense of harmoniously balancing individual details with the house as a whole. All the main rooms are symmetrical, yet, in a masterpiece of planning, Blondel squeezes a hidden world into the interstices complete with stairs and doors to the outside. Like Venice, or one of Escher's drawings of interlocking worlds, the house has a double circulation system. Where these worlds cross, a visitor might only see poché walls and hardly suspect that secret passages run behind the paneling, allowing servants discreet access to every room whose windows are open to light and air from the garden. What a wonderful house for a party if you could bear the expense of all those servants



5. Hyperbolic edge to the Ladybower bellmouth, 1935–1944. (Photograph by Peter Byrne 1991.)

emerging from the walls like spirits, present but unseen like services in a modern building.³⁰

What riches we have here, what an excess of possibilities in which familiar pleasures are enlivened by mystery. In providing comfort and convenience, Blondel's house is *heimlich* in many of the senses that Freud lists for that word, but it could easily become *unheimlich*, that is, uncanny.³¹ It would make a very good house for spying, for a secret introduction, for a murder mystery, or for a place to hold a seance. There will be little privacy in a place like this, one can stroll from room to room where almost anything might be going on, although that is probably a price worth paying for all the opportunities for gossip, comedy, intrigue, and love. No ladder would be needed to elope from an upstairs bedroom here; the backstairs would do just as well. The possibility of a secret escape fuels the imagination: think of the tunnel the Count of Monte Christo digs in the Chateau d'If, or of James Bond crawling through ducts, or Harry Lime vanishing down the sewers in Vienna in the film *The Third Man*.

It is also a superb place to play hide-and-seek. Not only are there a lot of places to hide but also there are loops in the circulation system that will allow someone who switches hiding places to stay ahead of a pursuer. It will not be possible to keep watch on someone in this house using much less than a guard in every room; in this respect, it is the opposite of a Panopticon that can be supervised by a single person. This is one reason why it will feel safe compared to the Ladybower bellmouth, where

one is always exposed in plain view and eventually everything goes down the hole. Spatially, Blondel's house is hyperbolic because the hidden realms connect with the open ones and provide intertwined circulation opportunities so that it will seem to expand in front of you as it is explored. Elliptical space, as found in black holes and closed universes, is finite, whereas hyperbolic space, such as we experience here, is open and infinite with an excess of space that appears as ripples and folds when seen from a higher dimension.³²

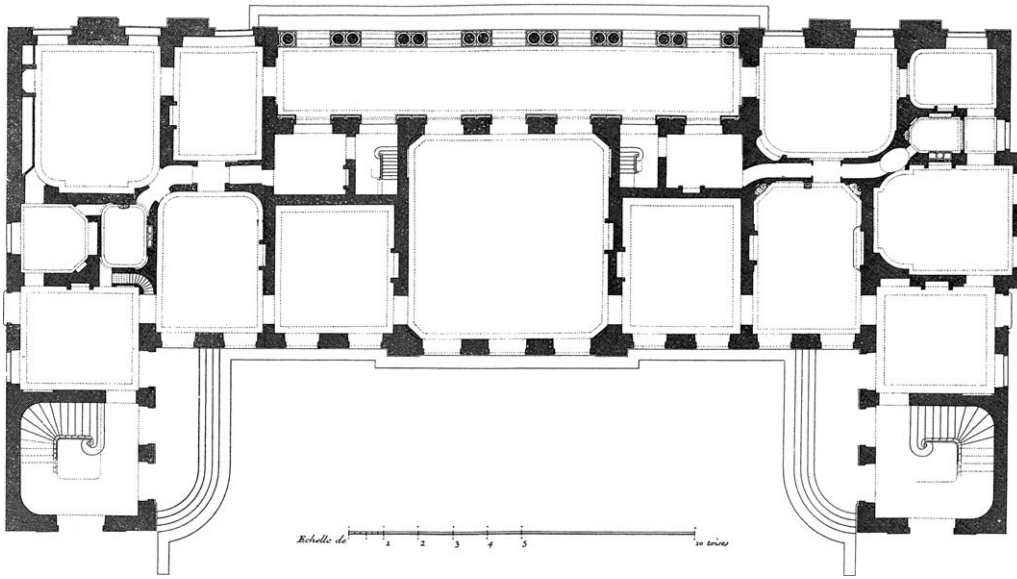
Oddly, Blondel's plan does not show any doors, and it is unclear where the entrance is supposed to be. An arrow might have helped, but where should it point? Perhaps there is another way to read Blondel's plan. Instead of seeing it as something entered from the garden, look at it as something entered from below by the little internal staircase, first into the servant's quarters, then into the house itself, and then finally into the garden. Because this *Ancien Régime* fantasy is an interface between the first and the third estates (in the British expression between "upstairs and downstairs"), to make that journey is to change scales, class of people, language, dress, and habits of thought. The movement outward is a spatial expansion from confined to open, elliptical to hyperbolic, dark to light, and from work to play. In every respect, crossing that boundary improves your life. The constricted corridor is a narrow gate that opens into a larger, lighter world. Understood metaphorically, it is a sensual image of a transition that is usually accomplished

in a dream through iron scrollwork gates, or a green door, or from the wreckage of a plane in the Himalayas. It is a door to a garden where no black arrow is to be found: a door to a world without death.

Conclusions

It cannot be said that these three objects resist representation perfectly since they retain enough of their purpose to be dismissed as a joke, or as plumbing, or as a servicing strategy. Only if we are willing do they reveal themselves as a providential message, or as an example of natural sublime, or as an image of the ineffable. Taken together, these examples possess a sort of dignity and economy that recall objects of meditation. They are able to play a game with existence and nonexistence because they are all places where, in different ways, people vanish. They tell, in an oblique sort of way, stories of death, hell, and heaven.

They are hard to photograph. The image of the black arrow is probably the only one in existence, and good as Byrne's photograph of the Ladybower overflow is, it does not really tell you what it is like to stand on the rim. It should be stressed that it would not make sense to do measured drawings of them. Surveying Asbestos House, most architects would not record the arrow because they would not see it; until it is pointed out, it is simply invisible as I experienced myself. As for the Ladybower overflow, I can only say, "Reader, try it yourself."³³ You could parody them, you could joke about them, and you could ask if a photograph does them justice, but in doing this, you are already speaking about them as if they were more like people than buildings. Because they are immaterial and elusive, we relate to them in a different way to buildings whose memorable silhouette we recognize in an instant. Such buildings may be iconic, and they may be beautiful, but they cannot stir us in the way a mystery can. After all, a silhouette is usually just a profile, but here, we encounter the larger themes of life face-to-face.



6. *Une maison de plaisance*, J.-F. Blondel, 1737. (Photo by author.)

Notes

1. *Dunciad*, book IV, lines 3 and 4. In James Sutherland ed., *The Poems of Alexander Pope* (London: Methuen, 1943), vol. 5, p. 339.
2. André Breton, *Mad Love* (Lincoln: University of Nebraska Press [*L'Amour fou*, 1937], 1987), p. 28 (italics in the original). Photographs of the objects by Man Ray are on pp. 29, 31.
3. *Ibid.*, p. 28.
4. *Ibid.*, p. 30 (italics in the original).
5. *Ibid.*, p. 28.
6. Longinus, "On the Sublime," in *Classical Literary Criticism*, T.S. Dorsch, trans. (London: Penguin, 1965), p. 127.
7. Edmund Burke, *A Philosophical Enquiry into the Origin of Our Ideas of the Sublime and Beautiful* (Oxford: Oxford University Press [1757], 1990), pp. 54–55, 158–61. See W.J.T. Mitchell, *Iconology* (Chicago: University of Chicago Press, 1986), pp. 125–27.
8. Thomas Sharp, *Town and Townscape* (London: John Murray, 1968), pp. 43–44.
9. Cullen Gordon, *The Concise Townscape* (London: Architectural Press, 1961), pp. 17–41.
10. Thomas Sharp, *Exeter Phoenix: A Plan for Rebuilding* (London: Architectural Press, 1946), p. 100. Thomas Sharp's proposals for Durham

are drawn in the same way: <http://catless.ncl.ac.uk/sharp/> (accessed July 14, 2008).

11. Caroline Constant, *The Woodland Cemetery: Towards a Spiritual Landscape* (Stockholm: Byggorlaget, 1994), pp. 133–35.
12. *Ibid.*, figure 46.
13. Asbestos House, Fountain Street, Manchester, by Cruickshank & Seward Architects, 1959, demolished 1999.
14. Letraset was a system of dry transfer symbols widely used by architects before the advent of computer graphics.
15. R. Bringhurst, *The Elements of Typographic Style* (Vancouver: Hartley & Marks, 1992), p. 75.
16. In Edmund Burke's *A Philosophical Enquiry into the Origin of Our Ideas of the Sublime and Beautiful*, the following sections apply to Ladybower. Part Two: Terror (section II), Obscurity (section III), Power (section V), Privation (section VI), Vastness (section VII), Infinity (section VIII), Succession and Uniformity (section IX), Magnitude (section X), Infinity (section XI), and Difficulty (section XII).
17. John Ruskin, *The Seven Lamps of Architecture* (London: George Allen, 1880, 1891), p. 142.
18. Drawings in an anonymous article "The Ladybower Reservoir," *The Engineer* 138 (November 1939): 440–42 show the overflow mastered by

an elevated walkway on twelve piers forming radial cutwaters. I can see no sign that it was ever built. It may have been omitted as a wartime economy measure or for fear it would attract the wrong type of tourist. If the walkway had been built, I calculate that a tall person leaning rashly over its balustrade would have been able to see at most seventy feet below water level, nowhere near the bottom of the hole as it turns out. Ladybower reservoir is in the Hope Valley, Derbyshire. Local standards: three miles from Ladybower, the long established *Peak Cavern* show cave changed its name in 2001 to *The Devil's Arse*.

19. "The Ladybower Reservoir," *The Engineer*: 441.
20. In freefall, it will take a little over three seconds to reach the bottom.
21. This does not limit the depth as much as you might think. To take an extreme example: if the steps were to decrease harmonically, for example, 1 foot, 1/2 foot, 1/3 foot, . . . then thirty steps will get you just over four feet forward. The next four feet will take over 1500 steps. No vertical view is ever possible because the series sum increases without limit, though very slowly. This is a true hyperbolic edge. Ladybower is not quite this severe but nearly as bad. Its interest comes from the fact that you can never quite get to the edge; it is always a little further away from where you find yourself.
22. Event horizon: the boundary in spacetime around a black hole beyond which it is impossible to return.
23. Devil's Staircase, see Benoit B. Mandelbrot, *The Fractal Geometry of Nature* (San Francisco: W.H. Freeman, 1977, 1983), p. 82.
24. *The Deep Blue Sea* is a play by Terence Rattigan about a suicidal dilemma. "The Devil and the Deep Blue Sea" is a song by Ted Koehler and Harold Arlen.
25. Michel Houellebecq, *H.P. Lovecraft: Against the World, Against Life* (San Francisco: Believer Books, 2005), pp. 153–54.
26. During the war, the Ladybower reservoir was used by the RAF to test Barnes Wallis's bouncing bomb. It later doubled as the Ruhr valley for the 1955 war film *The Dam Busters* about the use of that weapon.
27. The two engineers I asked thought trees would be the problem. For the dam to fail, they estimated between one hundred and two hundred years.
28. See "The Ladybower Reservoir," *The Engineer*: 442.
29. J.-F. Blondel, *De la distribution des maisons de plaisance* (Farnborough: Gregg Press [1737], 1967), p. 123 (Layout of Country Houses).
30. David Bass, "Towering Inferno: The Metaphoric Life of Building Services," *AA Files* 30 (1995): 26–34.
31. Sigmund Freud, *The Uncanny* (London: Penguin [1919], 2003), pp. 126–34. See Anthony Vidler, *The Architectural Uncanny* (Cambridge: MIT Press, 1992), pp. 3–20.
32. Margaret Wertheim, *A Field Guide to Hyperbolic Space* (Los Angeles: Institute for Figuring, 2007), pp. 11–49.
33. I do not mean that Ladybower could not be surveyed at all; a steep-plejock could do it with ladders and scaffolding, but a person on their own would be flummoxed.