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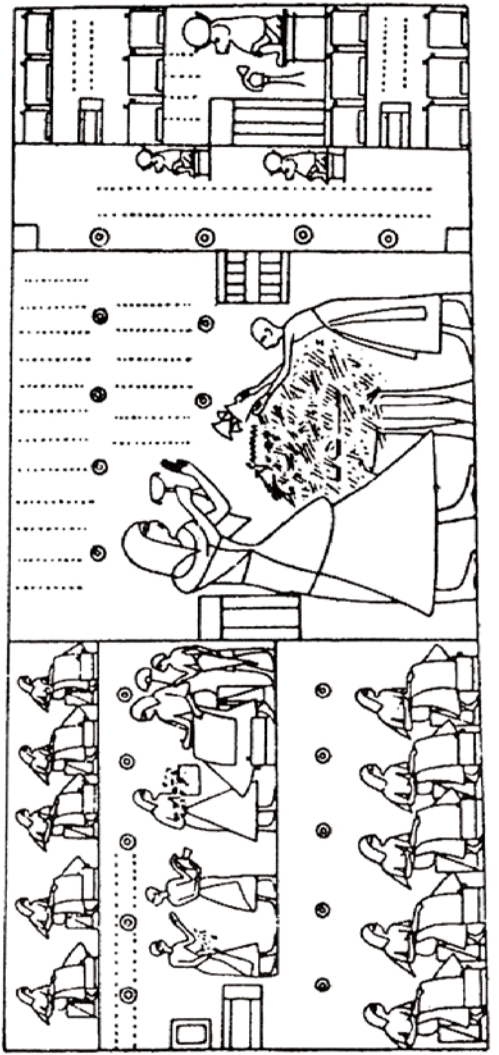
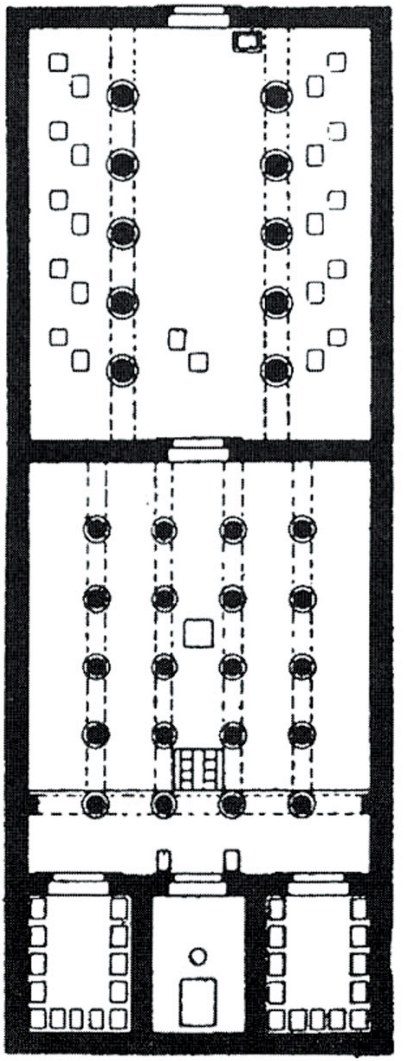
Cover: Detail, *The Portrait of Helen* by Zeuxis, from Cicero's *De inventione* (2.1.1–3). Flemish manuscript, ca. 1480 (Ghent University Library, ms. 10, fol. 80v).

Today our two-dimensional world is saturated with linear perspective, whether in photographs, on television, or, indeed, in much of art. Yet linear perspective is an invention rooted solely in the Western classical tradition.[1] Why did artists in the Near East, the Far East, Africa, and the Americas not come up with linear perspective on their own? Among the reasons is the Greeks' conception of geometry not as rules-of-thumb, but as a logical system of proofs. They also had the unusual desire to imitate reality in their art. I am not going to discuss those issues here. Instead I focus on one of the less obvious reasons: linear perspective is an impoverished system for representing information within a single frame.[2]

Egyptian art furnishes a prime example of what an artist can achieve without linear perspective. Consider the painted relief of the office of the vizier under Meneptah, the son of Ramses II, ca. 1232 B.C.E. (figure 1).[3] The rectangle is divided into three vertical sections of unequal widths that decrease from left to right. Only the center is not subdivided. It is devoted to the vizier, on the left, performing a sacrifice to Thoth with the help of a priest, on the right. The vizier takes up over two-thirds of the height and nearly half the width of his rectangle, while the priest is slim and does not even reach the vizier's waist. In other words, hierarchical perspective tells us which figure is more important. On the left are three rows of men hard at work. The top and bottom registers have five scribes each, seated to the right and writing on papyrus draped across their laps. The middle row has a larger figure, seated to the left, about to sign a document being submitted to him by the figure standing in front of him. That figure is accompanied by two lesser ones. Behind the seated figure is a small servant with a fan. On the far right are three rooms, again divided into three unequal horizontal sections. The top and bottom ones show storage boxes for documents, seen in a bird's-eye view, while the middle and larger room contains the god Thoth in the form of a baboon, seen in "normal" orthogonal perspective like all the other figures.[4]



1. Painted relief of the office of the vizier, ca. 1232 B.C.E. (Borchardt 1907–8, 59 fig. 1)

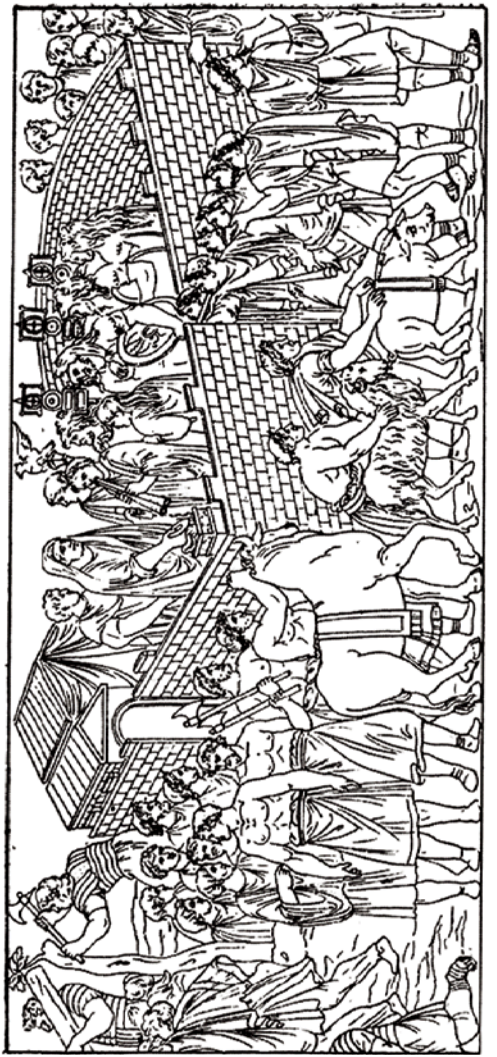


2. Ground plan of the office of the vizier, ca. 1232 B.C.E.
(Borchardt 1907–8, 61 fig. 2)

What makes this scene remarkable to someone accustomed to linear perspective becomes apparent only on closer examination, for the entire set of scenes is placed within a floor plan much like those we are accustomed to (figure 2). The building, like the division of functions, is divided into three sections. On the left the scribes are disposed in the three areas formed by the two rows of columns. The central section has four rows of five columns apiece that set this space off from the three rooms on the right. Nor did the artist stop with the basic ground plan. He also included all the entrances to the rooms, and by their size and placement indicated which were main doors and which were subsidiary ones. Two imposing entries — the one on the left of the middle vertical section and the one to Thoth's room — are both shown vertically, while the others are oriented horizontally and take up less room. Thoth's room is further guarded by two smaller Thoths on either side of the entrance.

Now try a thought experiment. Imagine this scene depicted in linear perspective. Whoops! We see nothing, because the exterior wall of the building blocks our view of the interior. Let us try again and omit the exterior wall. On the left, we see a line of five scribes, but not the two rows behind them whose view is blocked. Hence, the most significant action of this section — the signing of the document — is omitted. If, however, we raise the horizon line, the second row will appear, but its smaller size will de-emphasize its importance. Next, in the central vertical section, we see the vizier making a sacrifice and learn, perhaps, that he is physically shorter than the priest on the right, who, as taller, may be more important. Finally, on the right, one row of storage boxes can be seen. We have no idea what the layout of the building is like or precisely where the figures are within that building. In other words, linear perspective must ignore a large amount of information in order to preserve one kind of information alone, the physical aspects of the setting and its elements. In fact, to portray all the information contained within that single frame, a proponent of linear perspective would need at least ten drawings: a ground plan, four elevations for the entrances, and five pictures for the figures (three for the scribes, one for the central scene, and one of Thoth). Captions would help identify who is who and their relative importance.

As the Egyptian example demonstrates, linear perspective affects the amount of information portrayed. Roman art combines both the Egyptian system and linear perspective within the same frame in a manner that often jars our modern eyes with its seeming inconsistencies. For example, a *lustratio* on the Column of Trajan shows a typical *suovetaurilia*, with the *victimarii* on the left and the three animals being led in a single line in the usual orthogonal perspective along the outside of a walled camp (figure 3).[5] This part of the scene is reminiscent of earlier animal sacrifices of three animals, such as the one with two cows and a sheep on the altar of the Ara Pacis.[6] Yet on the far right, also outside the wall, are more figures, whose heads are the same size, even though they are farther away and are depicted above the wall. The head of the procession of animals turns through a gateway into the interior of the camp, where Trajan appears slightly larger than the figures surrounding him. At this point the visual problems become more obvious than they were for the figures on the far right outside the wall, who are actually around a turn of the column and therefore almost in a separate scene. For someone accustomed to strict linear perspective, Trajan and his group appear to tower above the walls, which in turn are only slightly higher than the figures outside — visually possible if the camp is on higher ground, but then Trajan and his men should be smaller than the figures outside the wall, not larger, as they clearly are. At the same time the group within the camp, like those outside it, are depicted in orthogonal perspective. Only the building is depicted in linear perspective, with a corner jutting out just above the middle of the bull's head; and the view is not, as the viewer might expect from the figures walking in a line outside it, looking up at the camp, but rather looking down in a semi-bird's-eye view on the scene within it. Even more visually confusing, the figures within the walls are depicted in orthogonal perspective like those outside the walls. Thus the scene is composed of elements that taken separately make visual sense, but not as a whole.



3. Lustratio, Column of Trajan, Scene 53 (132–34)
(Reinach 1909, 1:344 fig. 41)

Now think about how an artist would have portrayed the scene in strict linear perspective. As with the Egyptian depiction, the artist would have had to settle on either one view or multiple scenes. If he focused on Trajan, then he would have to omit the walls and the figures outside the walls. We would not know where the sacrifice was taking place nor what was going to be sacrificed, much less who attended the ceremony. Four separate scenes would be necessary to capture all the information: (1) the procession of sacrificial animals with attendants, (2) the figures on the far side of the camp, (3) the figures within the camp, and (4) a semi-bird's-eye view of the camp. In addition, a label might be necessary to identify Trajan. Although Trajan's action here marks him as the most important figure, in other scenes his slightly larger size definitely speeds his identification by the viewer.[7]

Furthermore the artist has conflated two separate moments within the overall celebration of the sacrifice.[8] The animals should already be within the camp, by the altar, when the initial libation is poured. Instead, Trajan is performing the libation at the altar before the animals have arrived within the camp. When these two segments — the procession and the libation — occur together on, for example, the so-called Altar of Ahenobarbus, the same conflation of time does not happen, because the animals are already standing within the same visual space as the altar.[9] The combining of two episodes within a single frame is common in Roman art because the Romans believed that space organizes time. This approach makes sense in a world that believed that time was not duration but motion through space — an idea that went back in art to at least as early as Polygnotos.[10] Hence, each place has its own action. For example, in a painting of Daedalus and Icarus from the House of the Priest Amandus, Icarus appears both in the sky at the top, as he begins to fall to earth, and then in a collapsed heap on the land below.[11] Again we see the same economy, as in the Egyptian picture, albeit somewhat reduced, since only two pictures would be needed for Daedalus and Icarus. Yet today we would never repeat a single figure within a single frame as the Romans did. Instead, we would repeat the setting in successive frames for that single figure, as we do in strip cartoons like *Doonesbury*.[12]

The modern focus on a single moment within a single setting is not a requirement of linear perspective, although linear perspective, with its singular emphasis on place, helped to foster that idea. Consider one of the more complex examples of continuous narrative within a single physical setting: a Flemish illumination of the story about Zeuxis and his portrait of Helen from a manuscript of Cicero's *De inventione* (2.1.1.–3), dated to ca. 1480 (figure 4).[13] Zeuxis "chose five [maidens from Croton] because he did not think all the qualities which he sought to combine in a portrayal of beauty could be found in one person."[14] To aid Zeuxis in his selection of the maidens, the Croton elders first showed him their equally handsome brothers wrestling. Four moments from this story are contained within a single frame. Zeuxis and the elders form a repeating group, with Zeuxis identifiable by his blue garment and green cap. The story begins in the upper left corner, which makes sense for a culture accustomed to reading from top left to bottom right. There the elders and Zeuxis meet to discuss the problem of finding appropriate models. A fence separates this scene from the next, which shows youths wrestling outdoors, below and to the right of the first scene. Then through a window on the upper right we see Zeuxis, the elders, and a crowd of suitable maidens, from whom are chosen the five with the most beautiful parts. These maidens then reappear demurely standing together in the lower and largest portion of the scene, where the seated Zeuxis paints his Helen. On the far left stand two of the elders, and on the far right an assistant prepares paint. The scenes do not simply flow from one to the other but are separated by physical structures. A fence lies between the first two scenes, the second of which takes place outside a building separated by a window overlooking the studio of Zeuxis. A conversion to our idea of unity of time and place would require four frames.

4. *The Portrait of Helen* by Zeuxis, from Cicero's *De inventione* (2.1.1–3). Flemish manuscript, ca. 1480 (Ghent University Library, ms. 10, fol. 80v)

What is significant is that the idea of repeating the figure within a single frame does not contradict any rules of linear perspective, which govern only the physical depiction of setting and the elements within it. In fact, the Flemish illumination exhibits a knowledge of how linear perspective works in the upper left-hand section that takes place outdoors. Here the fence and the buildings look like depictions of today's archetypal railroad tracks that converge at the top. Similarly the checkerboard floor of Zeuxis's workshop also obeys the laws of linear perspective, though not in direct coordination with the outdoor scene above it. In other words, the use of linear perspective has no direct effect on the portrayal of time in pictorial narrative. It is a separate phenomenon that governs physical setting alone.

In conclusion, artists always have to compromise when converting three dimensions to two dimensions. To a certain extent this tension highlights one of the problems Plato had with art, as in the description of the cave in *Republic 7*. Art could not depict *what you know*, but only *how it looks*. Linear perspective works best *only* for physical setting and the physical depiction of objects in the broad sense. If you are restricted in the amount of space available, then only a combination of visual techniques will allow you to include all the details. In short, the Romans never fully espoused linear perspective not because of technical limitations on their part, but rather because of the technical limitations of linear perspective that forced them to mix and match what we alone consider to be discrete systems of visual representation.

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NOTES

1. The bibliography for linear perspective is vast, and I have made no attempt to reference it here; nor have I given full bibliographies for the objects I cite. I am working on a study of illusionism in Greek and Roman art, and the ideas presented here will be discussed at greater length there.

2. Definitions of "linear perspective"—from informal to obtuse—are offered in numerous modern works on perspective. Elkins (1994, 63) is right when he says: "We have seen that the word perspective was often used in the plural, and that it was taken to be a collection of methods discovered at different times rather than a single discovery." He also includes (4–5) a handy chart outlining the kinds of "perspective" with their relationship to mathematics. Here I offer an informal explanation sufficient for this discussion. "Linear perspective" is a system of depiction that follows geometric rules to convert a three-dimensional scene to two dimensions and that reflects what we see rather than what really is. The "classic" example of linear perspective, taught to almost every schoolchild, shows a road or railroad tracks receding into the distance, with the two sides gradually converging on a single vanishing point, even though in reality the two sides are parallel and therefore do not meet. A simple box, drawn from an oblique view, similarly suffices as an example for two vanishing points, one on either side of the box. It remains hotly debated whether the Romans had "true" linear perspective, because certain wall paintings exhibit linear perspective in sections, but not necessarily throughout the whole painting. They certainly understood the idea behind the "railroad tracks," since they write about and depict colonnades with gradually decreasing columns, as in Lucretius (4. 426–31) and the Villa at Oplontis (Guillaud and Guillaud 1990, 70–71 fig. 110, and 60 fig. 88 for a photograph of an actual colonnade at Oplontis exhibiting the same effect). For a technical treatment, see Willats 1997, especially ch. 2 ("Projection Systems").

3. Borchardt 1907–8, 59 fig. 1, 61 fig. 2; Posner 1972, 87 figs. 20–21; Schäfer 2002, 133 fig. 112, with an excellent analysis of how the scene works. The scene appeared on the wall of the grave of Teji, private secretary of Meneptah.

4. "Orthogonal" perspective refers to a "flat" rendering of a scene with no indication of depth. The things depicted are perpendicular to the "base" line. In other words, only the façade of a building is depicted and not its sides. For a more formal definition and discussion, see Willats 1997, 43–46.

5. Scene no. 53. Ryberg (1955, pl. XXVII fig. 56) has pasted together two shots taken from the left and from the right, whereas Settis (Settis et al. 1988, 338–39, figs. 80–81) retains the separate photographs.

6. Simon 1968, pl. 9 bottom.

7. For example, Trajan on a boat-bridge with his legion behind him and a single figure ahead of him: scenes 48–49; Settis et al. 1988, 330 fig. 72.

8. Beard et al. (1998, 2.148) lists six stages for sacrifices, of which the procession of victims to the altar is the first and the libation at the altar the third.

9. Paris, Louvre; Kleiner 1992, 50 fig. 31 (early first century B.C.E.). On depictions of sacrifice in Roman art, see Ryberg 1955, 104–19.

10. Small 1999 with extensive discussion of the concept. For this chapter I have purposely chosen different examples to illustrate the same points.

11. This painting is from the east wall of triclinium b (Pompeii I, 7, 7); see *LIMC* 2, Daidalos et Ikarios no. 38, p. 318 with pl. 240 (J. E. Nyenhuis); Deutsches Archäologisches Institut, Rome, neg. no. 66, 1791.

12. Andrews (1995) investigates this issue at length and believes that photography fostered the lasting unity of place *and* time.

13. Ghent University Library, ms. 10, fol. 80v. Smeyers 1999, 454–55 with 454 fig. 54.

14. Cic. *De inv.* 2.1.2.

ORIGINAL SOURCES

Cicero. *De inventione; De optimo genere oratorum; Topica.* 1976. Translated by H.M. Hubbell. Vol. 2. Loeb Classical Library. Cambridge, MA: Harvard University Press.

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