

Wolfgang Metzger: Laws of Seeing

Chapter 2. Visible and Invisible Forms

Speaker: Chia Wei Lui (Bingo)

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October 12, 2009

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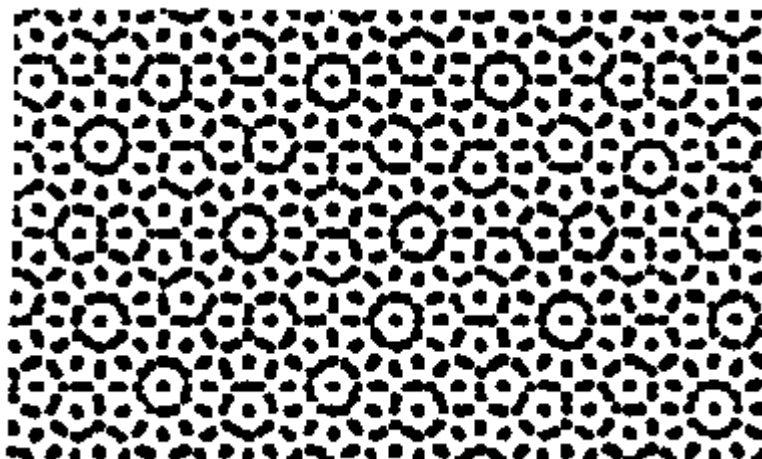
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Following up on the discussion after the last lecture, we showed a number of ambiguous figures from the Internet, containing two percepts in the same picture. These figures are also called bistable or reversible, because they alternate in perception. However, some patterns alternate spontaneously (like the Necker cube), whereas others require focal attention to find the two alternatives.

Sarina brought along a book by Maurits Escher who became famous for his ambiguous drawings of scenes. One of his best known patterns depicts a number of interconnected stairs which appear to lead up, but always come back to the starting point. Another shows black birds flying in one direction and white birds in the other.

The ambiguous figure below can be seen as “meadow” with many “flowers” in it. Yet, the flowers change position ever so often; you cannot hold them in place. This is comparable to a swarm of fish in which the individual fish disappears as soon as it is seen, making it very difficult for a predator to catch and eat it. A unique figure-ground organization is impossible.



In the second chapter of his book, Metzger tells us that we can see a form only when it is delineated by a contour. The line holds the form together in itself and defines it relative to the ground. Without a border around it, a figure becomes easily embedded in the background, as illustrated by the formless letters in the script below. (Here rests

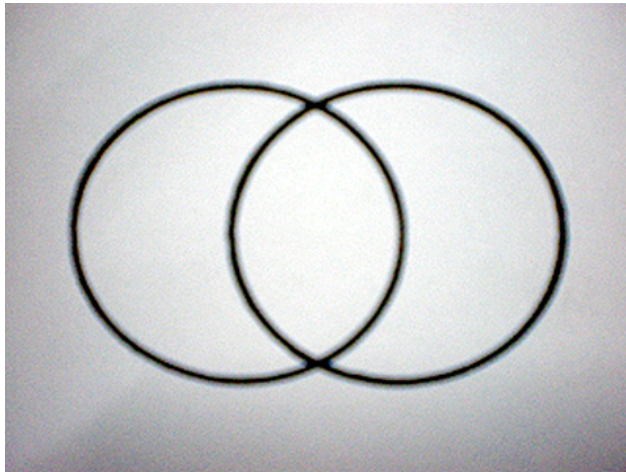


Figure 17

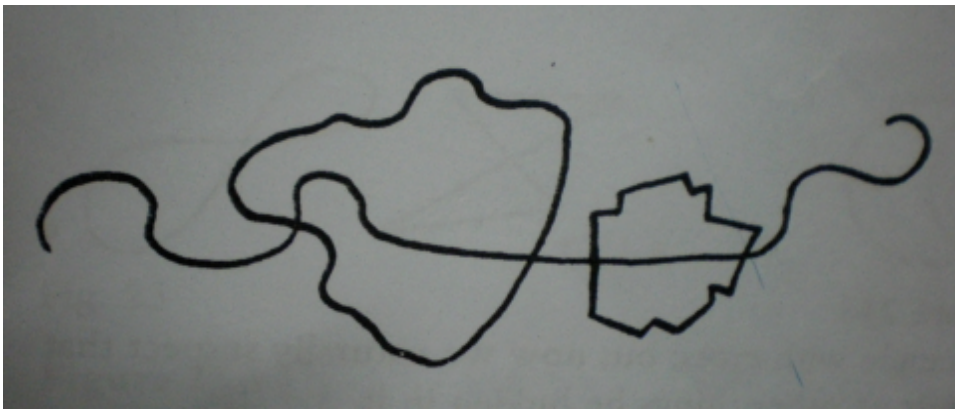


Figure 20

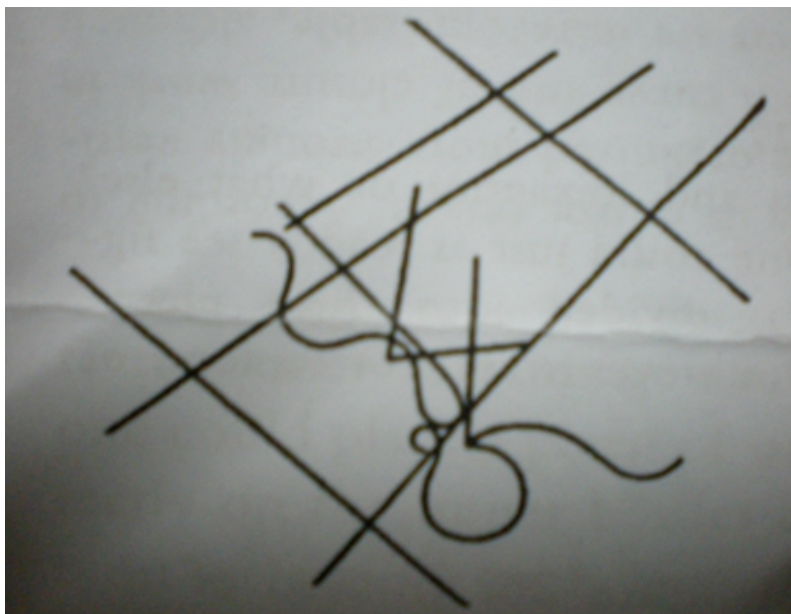


Figure 25



Till Eulenspiegel, 63 years) The message of this script is well-known in Germany, but is virtually impossible to read, because the letters are part of the background, whereas the black interspaces have assumed the status of figure due to the Gestalt factor of *closure*. The contour belongs to them, not the letters. However, as soon as a black horizontal line is introduced to “close” the white letters on top and bottom, figure-ground organization reverses, and now the letters are readable whereas the interspaces become invisible. (Thank you, DingDong and Bingo, for this beautiful rendition.)

In Figure 17, we see two rings overlapping each other. There are many other (“unnatural”) ways of seeing this figure, but we don’t see them at all or only with great effort. This is because of the Gestalt factor of *good continuation*. Some people also see two crescents on the left and right side and an almond in the center, due to the Gestalt factor of *symmetry* and the law of the *common center*. This “percept” is actually preferred in touch, suggesting that the two Gestalt factors have different weight in the visual and tactile modality. (Try both tasks among your friends.)

Metzger states that it is not up to us to choose how we see a given stimulus. The percept becomes organized according to the Laws of Seeing. He claims that these laws are universal across individuals and, as we will see in subsequent chapters, also govern visual perception in the animal kingdom. (Li-Chuan: How about the effect of experience?)

The Gestalt factor of *good continuation* is also the reason why we don’t see the number “4” in Figure 20. In order to see it, we would have to introduce five gaps to break up the false continuations. In comparison, the same number “4” is easily discerned in Figure 25 despite the many crisscrossing lines, because none of them connects with it. Camouflage makes use of this principle by disguising the “breaks” where a line ends or by introducing artificial “breaks” where there are none in the

original stimulus. Importantly, a line crossing is never an end point.

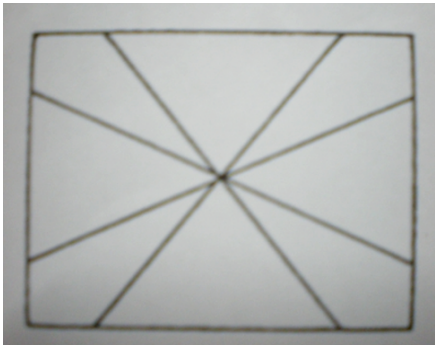


Figure 21

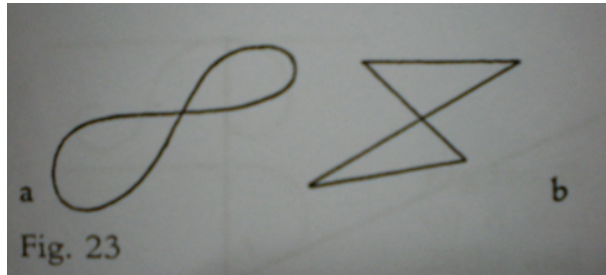


Figure 23

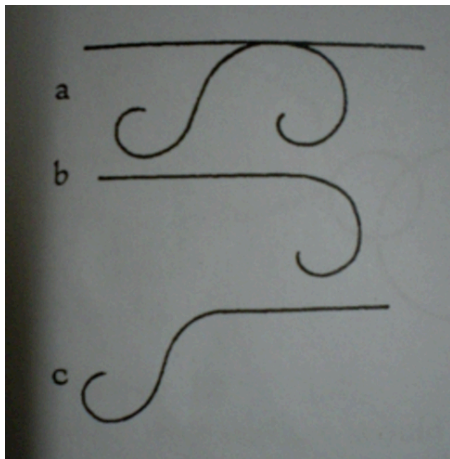


Figure28

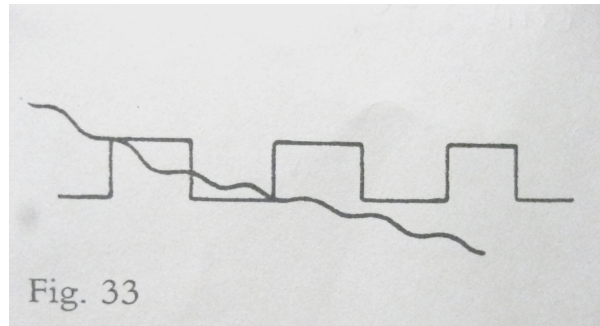


Figure33

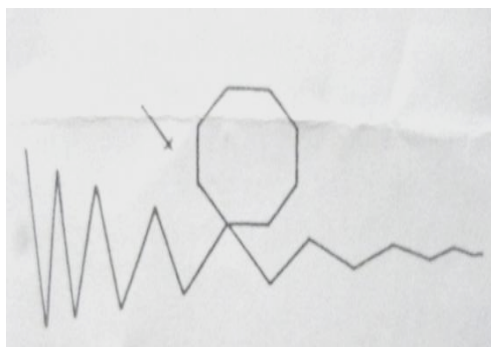


Figure34

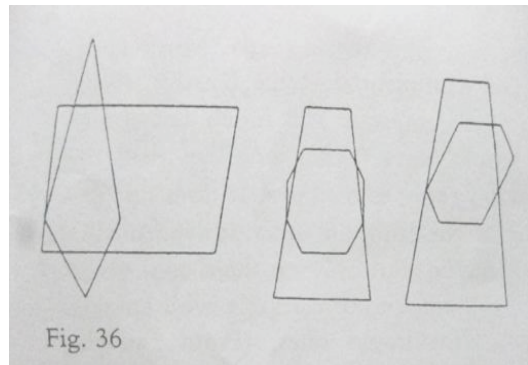


Figure36

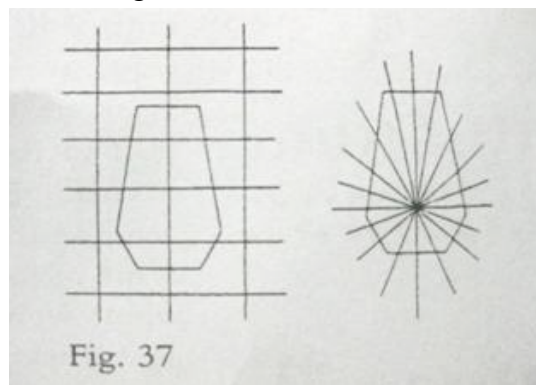


Figure37

Figure 21 shows a diagonal cross (some may also see a standing cross) on a square background, but we cannot see the three shapes below, which are contained in it (see also chapter 1, Figure 16A). This is because of the Gestalt factors of *smooth continuation* and *symmetry* (or balanced form). The factor of *good continuation* is also at work in Figure 23, where the number “8” is a better figure than two drops attached to one another. Similarly, a perceptual segregation into a symmetrical cross and hexagon makes more sense than the assembly of irregular parts that we otherwise would see. (Li-Chuan: How about the effect of experience?)

In Figure 28, we see a horizontal line and a curved line touching it from below, but the Gestalt factor of *similarity* tricks you into seeing a “better” percept instead of two canes.

Metzger first published the individual chapters of his book in the popular journal NATUR UND VOLK (Nature and People), but even if you knew it, you would not recognize those words in the foreign script below (left), as it connects smoothly with its mirror image on top. This shows the power of the Gestalt factors of *good continuation* and of *closure* in an example where experience should prevail, as we have seen these letters countless times. Yet, if we introduce a line in the middle to separate the top from the bottom, the correct words pop out immediately (same figure, right). Bingo and DingDong, thank you again for this nice rendition.)



The Gestalt factor of *similarity* helps us to separate the wavy line from the rectangular line in Figure 33, making it virtually impossible to see these two lines intertwined. The same factor of *greatest unity* determines why we see a jagged line and an octagon in Figure 34. (Bingo says that she can see the zigzag line continue first into the octagon and then loop back into the zigzag line.)

Camouflage is very effective in Figure 36, which shows an irregular hexagon sharing contours with a trapezoidal background. Again, it is almost impossible to perceptually isolate the hexagon because of the hidden break points and the factor of *smooth continuation*. However, in Figure 37, the hexagon is easily seen although there are many more lines superimposed onto it. This example is analogous to the number “4” in Figure 25.