

Optical and Spatial Illusions by Shadow Effects

by Guenter Polhede, D-Stemwede
translated by Ulrike Storm

Description of the real photo

The first photo represents reality, showing part of a tree.

The spot concerned is located bottom right, where a branch was cut off. A lip around the spot is indicating that the cut is healing, a depression still being in the center of the spot.

The action of light from above is throwing a shadow over the upper lip-edge into the depression.



first photo (reality)

Description of the turned photo

The second photo is the first one turned by 180 degrees. The above mentioned spot of the severed branch can now be seen upper left.

There are now two possible ways of optical interpretation, depending on how the shadow of the lip is being read.



second photo (turned by 180 degrees)

Two ways of optical interpretation:

One is – with a certain likelihood – to see the real depression as something sticking out and the real lip as a sunk-in ring around it. This way of reading is most likely the case if one approaches the cut-off spot by looking from above right and by assuming the shadow being created by the light coming from above right.

The other way of reading is to see the lip bulging out and the middle as a depression, i. e., the “real” way, as in the first photo. If interpreting it this way, the shadow would have to be created by the light coming from below left. This way of reading occurs most likely when approaching the cut-off piece by looking from bottom left.

Interpretation of these shadow effects

Two-dimensional photos create our three-dimensional reading by the effect of shadows.

With the first photo this effect corresponds with our visual experience.

With the second photo alienation has been created, by having turned reality by 180 degrees.

Obviously our visual experience cannot unmistakably interpret this and can cause two different ways of reading.

When interpreting the depression as something sticking out as well as the lip as a hollow ring, it shows that our brain has not only turned the photo vertically but also horizontally by 180 degrees.

When interpreting the spot as in reality (the center as a depression and the lip as something bulging out), our brain “makes” the source of light come from below.

Both ways of interpreting the shadow effects do not correspond with our visual experience.

Thus, our three-dimensional view by interpreting shadow effects works in two different ways: Either seeing the center of the spot as something sticking out – contrary to the real shadow effect – or seeing the center of the spot as a depression, which means accepting the shadow being caused by the source of light coming from below, although this is contrary to the normal situation, namely the source of light coming from above.

Analysis

Unusual shadow effects can lead to irritations and can arouse our attention.