

From Russia, With Love

Topics: The Shadow/Highlight command (known today as Shadows/Highlights) and other methods of dealing with overly dark originals.

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This archive, to be released over several years, collects the columns that Dan Margulis wrote under the *Makeready* title between 1993 and 2006. In some cases the columns appear as written; in others the archive contains revised versions that appeared in later books.

Makeready in principle could cover anything related to graphic arts production, but it is best known for its contributions to Photoshop technique, particularly in the field of color correction. In its final years, the column was appearing in six different magazines worldwide (two in the United States).

Dan Margulis teaches small-group master classes in color correction. Information is available at <http://www.ledet.com/margulis>, which also has a selection of other articles and chapters from Dan's books, and more than a hundred edited threads from Dan's Applied Color Theory e-mail list.

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From Russia, With Love

The Shadow/Highlight command, new in Photoshop CS, is revolutionary and great potential in dealing with certain problems. Without understanding each of its settings, however, it can be like playing Russian Roulette.

Eight a.m. in Red Square, a brisk April morning in Moscow. A nasty time to take pictures, but my only chance: in two hours I'll be speaking; I won't get out until six. That's a problem, because as explained by that great exponent of photographic technique, Yogi Berra, it gets late early there. Plus, Russian trade shows supply caviar and vodka, lots of vodka, for foreign speakers during the intermissions, so that they won't get hoarse.

So much for the excuses. The lighting is bad, the photography worse, but it was a significant experience in my life and Figure A is a picture of it, by God. It's not a very *good* picture, mind you, and certainly not worth a lot of effort to fix. It takes only seconds, however, to produce Figure B, thanks to a revolutionary development introduced in Photoshop CS.

In addition to a couple of mankind's more significant revolutions, Russian history contains, in my opinion, more highlights and shadows than that of any other nation. So there is a certain justice in using it to illustrate how the new Image>Adjustments>Shadow/Highlight command works. We'll leave the Kremlin now, and head for the village of Kolomenskoye, founded in the 13th century.

At six foot three, the man in the next series of images is too short to be Peter the Great, who spent much of his childhood here, and too young and too friendly to be Ivan the Terrible, who liked to hunt in the nearby woods. It's actually Valery Pogorely, publisher of CompuPrint, the Russian magazine that carries this column, but even his family would not know him from the appalling Figure C.

Last time, I showed how to correct such images with blurred overlays, a powerful approach that takes much more time than S/H. This time, we'll compare S/H to two more conventional methods. All three results could be made better, but for purposes of comparison I'm limiting moves to the bare minimum, rather than trying to hit every color perfectly, sharpening, or fixing other obvious defects. The basic corrections were done in RGB (S/H doesn't work in CMYK, alas) but once the

three were converted to CMYK, I equalized their shadow values in the interest of a fairer competition.

Figure E is both the worst of the three efforts and the hardest to execute. It lightens the image through a mask that restricts their effect to darker areas, so that the highlights won't blow out. Often we use an inverted grayscale version of the image as the mask; here it's better to use a copy of the blue channel, which is blank where the sky is yet has a rather dark face.



The Shadow/Highlight command, introduced in Photoshop CS, specializes in this kind of image.



The overly dark original, Figure C, is transformed into D by the methods shown in this column. Figures E and F are more conventional corrections: E was produced by curves applied through a mask based on the blue channel, and F was assigned a false profile that changed Photoshop's definition of RGB.

Having loaded this inverted copy of the blue as a mask, I made a duplicate layer and applied curves to the green and red channels to lighten the face. I then changed layer mode to Luminosity so that the image would not become too yellow.

Yet Figure E, which has a reasonable face, falls afoul of the sad fact that darkness and grayness go hand in hand. It looks like a black and white. Shadow/Highlight's way of avoiding this problem is a little-noticed "Color Correction" field, which saturates the shadows as it lightens them. You can turn it off by setting its value to zero, or even desaturate by making it a negative number. Its default is +20, and, like the other settings, improper use of this weapon can backfire. Here, I increased the Color Correction setting to +35, which seems to have gotten a reasonable face and background browns. But it found a tiny bit of blue in the top of Valery's gray sweater and went nuts with it. It's fixable, but before choosing the setting, you might want to ask whether it's easier to hike colors after S/H than to cut such areas back.

Figure F is more competitive. It, too, has hiked the colors, but in a sneakier way—with a false profile. A full explanation is beyond this column's scope, but it involved inventing a new RGB, based on the psychedelically colorful Wide Gamut RGB primaries coupled with an absurdly light gamma setting of 1.0, and then, with a straight face, telling Photoshop to assume that that's the RGB this picture was in.

The method may be dishonest, but it's even quicker than S/H. People who use this technique tend to have a dozen or more such false profiles sitting on their systems, as I do. To get to Figure F, therefore, I simply went Image>Mode>Assign Profile and the whole thing took three seconds.

The blur's the thing

With a bit more work, either Figure D or F could be made into quite a presentable image—but they're totally different pictures, looking like they weren't taken in the same light. The face is more rounded in D, the background trees darker, the hair and the jacket more detailed and more attractively colored. I don't care for what happened to the wooden building, but if you point a gun at me and force me to choose, I'm taking D. Furthermore, if D is what we want, it won't be easy to get there from either E or F.

The unusual shaping effect results from proper application of S/H's Blur field. It's the third setting in the dialog box, but because it's the key, it's the one that should be set first.

To see what's going on, we need to exaggerate the lightening by increasing the first two fields, Amount and Tonal Width, beyond the values we actually intend to use. If need be, we can set both to the maximum 100%, but any settings that give us a decidedly lighter image than we want will work. I chose Amount 95%, Tonal Width 65%, and proceeded to investigate the Radius. Figures G-K show Radii of 5, 20, 35, and 55 pixels, respectively.

Before discussing why it happened, let's agree on what *did* happen. The 5-pixel Figure G makes borscht of the face. At 20 pixels, we start to see more shape in the background, and some more definition in the face, but not nearly as much as at 35 pixels. At 55 pixels, we start to go back into the wrong direction. So, 35 pixels it is. Now, why?

As we saw in the September column, S/H uses a blurred version of the original to force shadows lighter. How blurry that blurred version is makes all the difference. A person

standing in the center of the image, as Valery does here, is an obvious focus of interest, so let's limit the discussion to him.

The hair, the eyes, the beard, and the jacket are all dark enough to attract special attention from the S/H algorithm. The fleshstone might not be, particularly in the red channel. That's why Figure G is flat. The really dark objects lighten; the semi-dark ones don't. In the wider-Blur versions there's an attractive reflection where the hair is parted. In Figure G, which also renders Valery in need of some Grecian Formula, the reflection is scarcely visible.

In Figure H, as the blur gets blurrier, we see more depth in the eye sockets, because the combination of eyes and eyebrows in the blurred version have gotten large enough to lighten a significant area of skin. In Figure J the cheeks get lighter too, as the beard expands to affect them.

And the black hair has returned—or at least it has at the edges. The sky is quite light, so it lightens the top of the head in the blurred version. Similarly, the shock of hair that hangs over the forehead is surrounded on three sides by flesh. That part of the hair will vanish from the blurred version; it won't be considered part of the shadow at all, and, like the top of the head, lightens far less than it did in Figure G. In a further favorable development, the background surrounding the hair lightens, because both have become almost the same weight in the blurred version. In Figure G the hair lightens drastically and the background not at all; in Figure J they both lighten slightly. The subtle haloing effect is one of the factors that makes Figure D, in my opinion, more convincing than the false-profile Figure F, which never used a blurred version.

We reach the point of diminishing returns with the 55-pixel blur of Figure K. The facial detail is lessened because the extreme blur leaves nothing but a featureless head and body. Note how the sweater suddenly lightens, because all distinction between it and the jacket has vanished—both of them

are relatively dark now, as far as the S/H algorithm is concerned, and they get lightened equally.

To hammer home the point of what the blur does, I've made two difference-mask graphics that illustrate in greatly exaggerated form how Figures G and K vary. Figure N shows where Figure G is the lighter of the two. The beard, hair, and eyes are well defined, showing that they have fallen victim to excessive lightening. Figure O, the converse, indicates that the bigger blur lightens the face and the tops of the shoulders. In Figure O, note the pronounced haloing: the lightening doesn't stop at the edges, but continues on into the background.

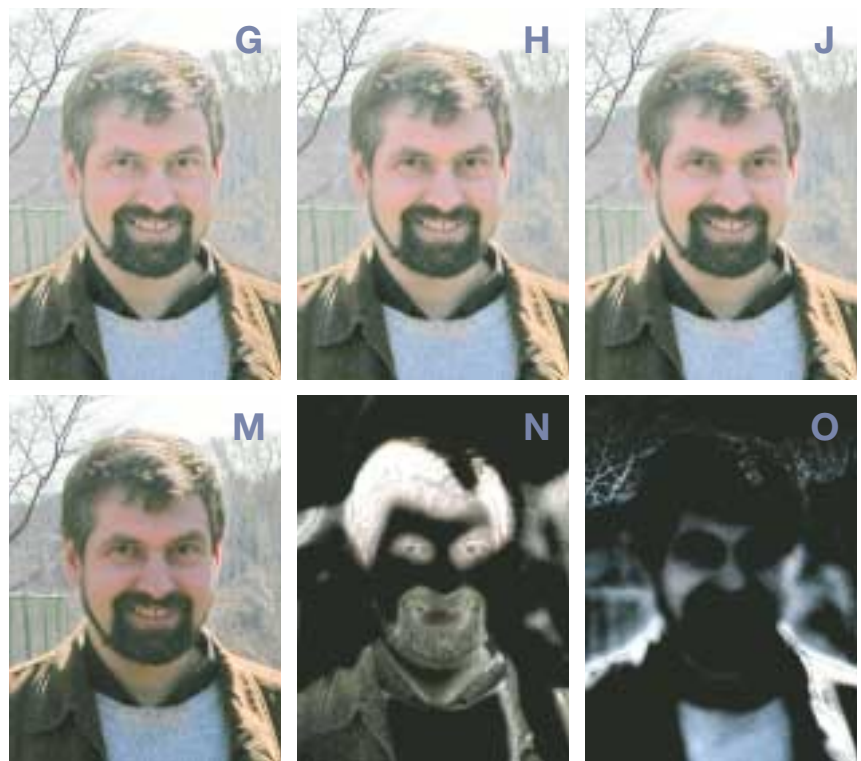
Finally, we have to choose the proper Amount, which governs how drastically the shadows lighten, and Tonal Width, which defines how dark something need be to be considered a shadow in the first place. We're currently at Figure J, properly blurred but too light. Adjusting one or both of these fields downward will fix that, but in different ways.

Figure L knocks the Tonal Width down from 65 to 40, preserving the open shadows. Figure M works on Amount instead, lowering it from 95 to 50, retaining more contrast in the background at the cost of slightly closing the face. Of course, we could try to capture the strengths of both versions by lowering both fields in smaller increments. I prefer Figure L and went with it, but you can get almost whatever you want: S/H is nothing if not flexible.

The woman on the pedestal

In the shadow of a huge convent, built in 1524 to commemorate a Russian military victory, lies the Novodevichy Necropolis, possibly the world's most distinguished cemetery. Outside of Santa Croce cathedral in Florence, you won't find such a collection of cultural luminaries buried in one place: Chekhov, Gogol, Shostakovich, and many others, in addition to a host of scientists and Soviet-era politicians of varying pal-

To choose proper values for Shadow/Highlight, start by setting the Amount and Tonal Width fields higher than necessary, and evaluate different Blurs. Figures G-K share settings of Amount 95%, Tonal Width 65%. The blurs are 5, 20, 35, and 55 pixels respectively. L and M explore whether to reduce Amount or Tonal Width to restore proper darkness. L is Figure J with Tonal Width reduced to 40%; M is J with Amount reduced to 50%. Figures N and O show the impact of a higher Blur setting by comparing Figures G and K. Figure N shows, in greatly exaggerated form, areas in which Figure G is lighter than Figure K, and Figure O shows the areas where K is lighter than G.





P

Half in sunlight, half in shadow, Figure P cries out for a Shadow/Highlight move. Figure Q is corrected with the settings on the opposite page.

S/H exercise, but Figure P, half in shadow and half in bright sun, is a better counterpoint to the last series. The statue portrays the stylish and elegant Raisa Gorbacheva. As may be deduced from the flowers, the former Soviet first lady occupies a place in her country's psyche rather like that of an American who also died young, Jacqueline Kennedy.

Because the right side of the image is blown out, we'll need both ends of the S/H command here. As this highlights don't carry important detail, we won't worry too much about exact settings; as long as it gets a bit darker, that's close enough. We need to be more careful with the shadow settings,

which can't use the same values as in the last set.

The statue and the background certainly should get lighter, but we don't need to use such a large Amount setting because the original appearance isn't nearly as dark. Also, since faces are supposed to be colorful but bricks aren't, we need to use a lower Color Correction value, lower even than the default 20%.

The Blur setting needs thought. Nothing in the dark areas has anything as important as the texture of Valery's jacket or his face. As long as the statue and wall get lighter, we don't care if they pick up detail. There is, however, detail that can be lost if we aren't careful.

The light stone inlays in the brick wall honor some who weren't quite big enough to rate space in the necropolis proper. Falling in shadow, they're darker than they should be, but if the Tonal Width is set high enough to catch them the whole picture will wind up in Siberia. Yet if they are left alone while S/H lightens the bricks, the whole wall will look flat.

In the previous example, we saw how a huge Blur setting affected Valery's light sweater, by wiping out the distinction between it and his dark jacket and forcing both lighter. It was annoying in that context, but here the same thing works well. A big enough blur will obliterate those light inlays and assure that they get lightened as much as the surrounding wall does.

Although the Amount setting is lower, the Tonal Width must be greater than last time. Otherwise, the command won't affect the left side of the wall, which starts out

latability.

Western tastes run to austerity in tomb design. Not so in Russia. The country's best sculptors have gotten assignments here. Some of their ideas are not just creative, but downright whimsical. Granite jets fly out of the graves of the aircraft designers Tupolev and Ilyushin. A violin juts out of David Oistrakh's tombstone. The monument to Nikita Khrushchev is an undisguised political statement: a frightening abstraction of interlocking pieces of black and white stone, creating a complex, seemingly pointless morass of highlights and shadows, much like the man's life.

The Khrushchev memorial might have made for a good



Q

lighter than anything in the previous image.

This picture doesn't have important detail in the deep shadows and bright highlights. Therefore, unlike either of the others, it could use a touch of the Midtone Contrast S/H setting, which allocates more of the tonal range to the midtones at the expense of the highlights and shadows. This setting should be used in moderation, if at all: if midtone contrast is a serious problem, it's better to hit it with standard curves, after the application of S/H.

A ruble for your thoughts

So ends our tour. There are many more sights I'd like to show, but this is a magazine column, not *War and Peace*. I will remark that not all my images are quite this bad. These have their purpose, however, in demonstrating the role of each setting, particularly the Blur.

As we saw last time, there are ways to achieve the same or even better results on images like this with a series of blurs and overlays that made Kremlin politics look simple. S/H takes a fraction of the time, and it can add an extra edge not just to poor originals like these three, but to almost any image where the shadows and/or highlights need some extra bite.

Without understanding what each field does, however, we can find ourselves limiting the use of S/H to amateurishly dark images, a dreadful waste of a good tool that, like Russian history, deserves careful study.

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