Fig.1

The bit depth of the image is responsible for the number of different tones which can be distinguished. The higher the bit depth the finer the tones are digitized.

High dynamic range of the sample needs high bit depth to be able to get all the details in the grey values of your image (see Fig.1)

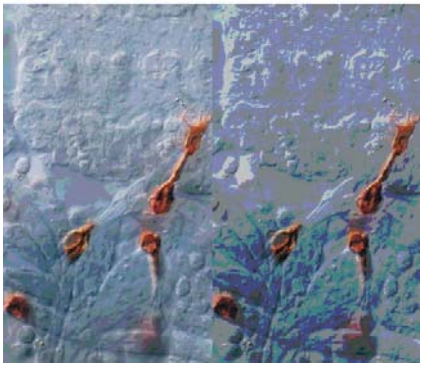


Fig.2

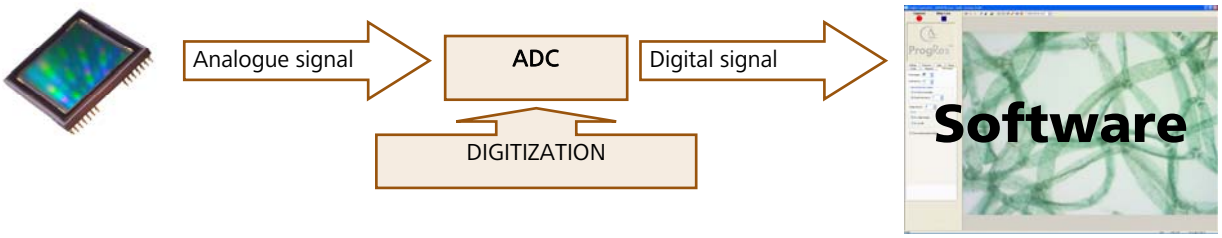
Fig. 2 shows images with definitely to less bit depth. You don't have smooth changes in the image. You miss details.

In microscopy you see this effect sometimes in dark areas, when digital gain is used to much. When you have enough grey values you have a smooth change of tones.

The number of bits defines the number of different grey levels.

8bit	256 grey levels (2^8).
10bit	1024 grey levels (2^{10}).
12bit	4096 grey levels (2^{12}).
14bit	16384 grey levels (2^{14}).

The ADC (analog-to-digital converter) *(verlinken zum FAQ ADC)* in our microscope cameras changes the analog voltage value from the CCD sensor into a digital value, a number of bits.



In monochrome cameras you only use
one grey value to characterize the pixel.
Color cameras provide 3 values,
one for each color channel Red, Green and Blue.

ProgRes® digital microscope cameras provide 12 or 14 Bits for finest tones and colors.