

In [12]:

```
from skimage.io import imread, imshow, imsave
from skimage import img_as_float, img_as_ubyte
from numpy import roll, dstack
```

In [20]:

```
def align(img):

    img_f=img_as_float(img)

    h=img_f.shape[0]//3
    cl= int(img.shape[0]*0.05)

    b=img_f[0+cl:h-cl,cl:img_f.shape[1]-cl]
    g=img_f[h+cl:2*h-cl,cl:img_f.shape[1]-cl]
    r=img_f[2*h+cl:3*h-cl,cl:img_f.shape[1]-cl]

    bigcor=0
    for i in range(-15,15,1):
        bi=roll(b,i,0)
        for j in range(-15,15,1):
            bj=roll(bi,j,1)
            correlation=(bj*g).sum()
            if(correlation>bigcor):
                bigcor=correlation
                sb0=i
                sb1=j

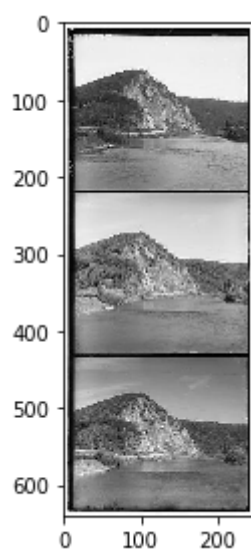
    bigcor=0
    for i in range(-15,15,1):
        ri=roll(r,i,0)
        for j in range(-15,15,1):
            rj=roll(ri,j,1)
            correlation=(rj*g).sum()
            if(correlation>bigcor):
                bigcor=correlation
                sr0=i
                sr1=j
    r = roll(r, sr0, axis=0)
    r = roll(r, sr1, axis=1)
    b = roll(b, sb0, axis=0)
    b = roll(b, sb1, axis=1)
    res = dstack((r, g, b))
    return res
```

In [24]:

```
imshow(imread('01.JPG'))
```

Out[24]:

<matplotlib.image.AxesImage at 0x181c77f6e10>

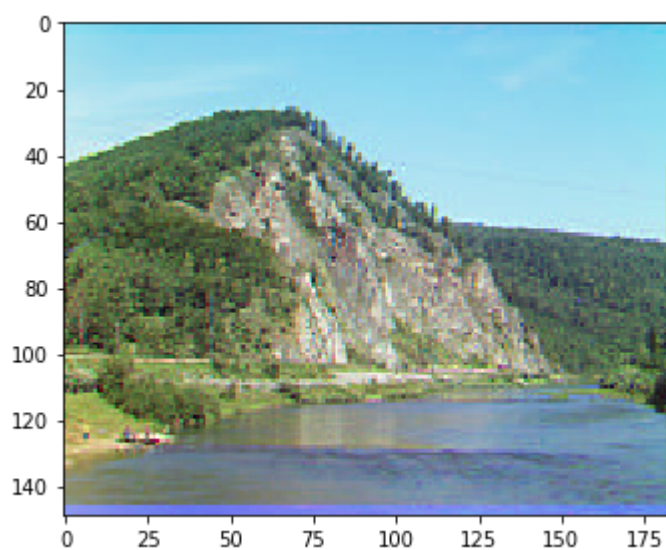


In [25]:

```
imshow(aligned(imread('01.jpg')))
```

Out[25]:

<matplotlib.image.AxesImage at 0x181c784f5f8>

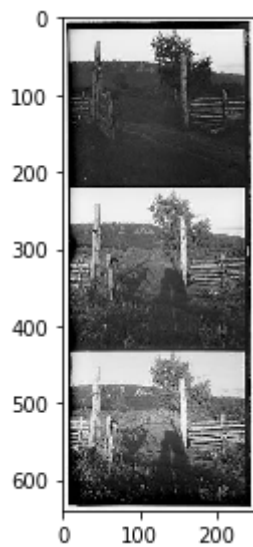


In [26]:

```
imshow(imread('02.jpg'))
```

Out[26]:

<matplotlib.image.AxesImage at 0x181c7be2be0>

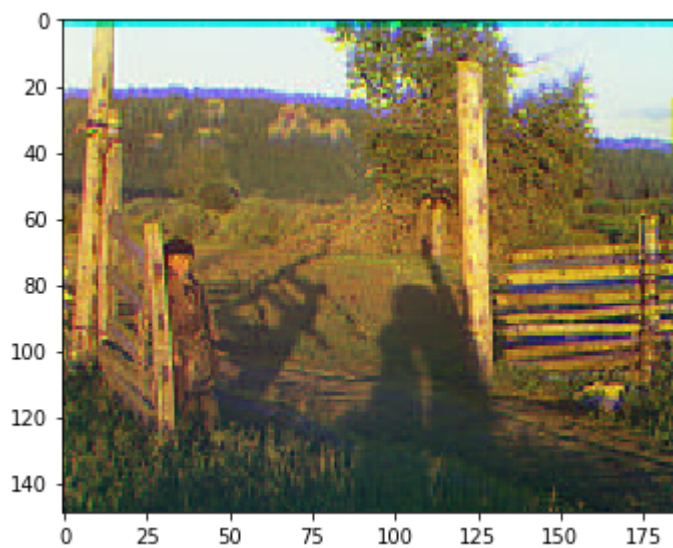


In [28]:

```
imshow(align(imread('02.jpg')))
```

Out[28]:

<matplotlib.image.AxesImage at 0x181c95ed978>

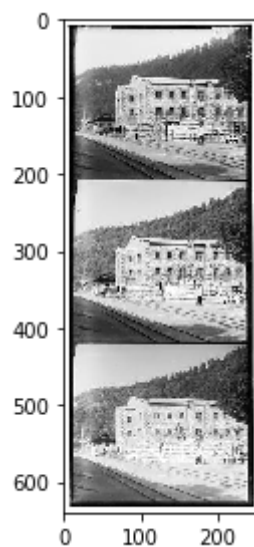


In [29]:

```
imshow((imread('03.jpg')))
```

Out[29]:

<matplotlib.image.AxesImage at 0x181c9649e80>

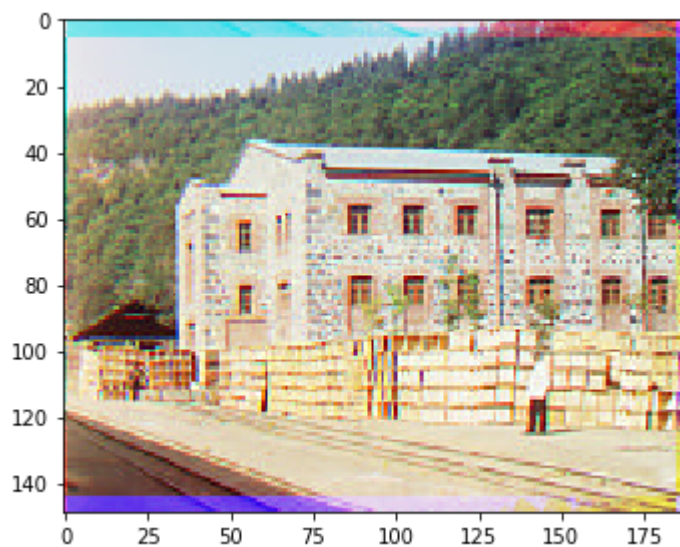


In [30]:

```
imshow(align(imread('03.jpg')))
```

Out[30]:

<matplotlib.image.AxesImage at 0x181c7cd75c0>



In []: