In [137]:
```
from skimage.io import imsave, imread, imshow
from numpy import roll, dstack
%matplotlib inline
from skimage import img_as_float
```

In [138]:
```
def getbestcor(firstimage, secondimage):
    from numpy import roll
    maxcory = 0
    maxcorx = 0
    pretendy = 0
    pretendx = 0
    secondimagey = roll(secondimage, -15, axis=0)
    secondimagex = roll(secondimage, -15, axis=1)
    for i in range(32):
        curcory = (firstimage * secondimagey).sum()
        curcorx = (firstimage * secondimagex).sum()
        if curcory > maxcory:
            maxcory = curcory
            pretendy = i - 15
        if curcorx > maxcorx:
            maxcorx = curcorx
            pretendx = i - 15
        secondimagey = roll(secondimagey, 1, axis=0)
        secondimagex = roll(secondimagex, 1, axis=1)
    return pretendy, pretendx
```

In [139]:
```
def cutter(img):
    hshape = img.shape[0]
    thirdpart = int(hshape / 3)
    deadsome = img.shape[0] % 3
    r = img[2 * thirdpart: img.shape[0] - deadsome, :]
    g = img[thirdpart: 2 * thirdpart, :]
    b = img[0: thirdpart, :]
    return r, g, b , thirdpart
```

In [140]:
```
def align(img):
    img = img_as_float(img)
    r, g, b, thirdpart = cutter(img)
    rounder = 0.34
    vkill = int(r.shape[0] * rounder)
    hkill = int(r.shape[1] * rounder)  # мозг уже умер, но тело работ
ало дальше
    rshort = r[vkill: -vkill, hkill: - hkill]
    gshort = g[vkill: -vkill, hkill: - hkill]
    bshort = b[vkill: -vkill, hkill: - hkill]
    g2ry, g2rx = getbestcor(gshort, rshort)
    g2by, g2bx = getbestcor(gshort, bshort)
    r = roll(r, g2ry, axis=0)
    r = roll(r, g2rx, axis=1)
    b = roll(b, g2by, axis=0)
    b = roll(b, g2bx, axis=1)
    res = dstack((r, g, b))
    return res
```

In [141]:
```
ims = []
ims.append(imread('1.jpg'))
```

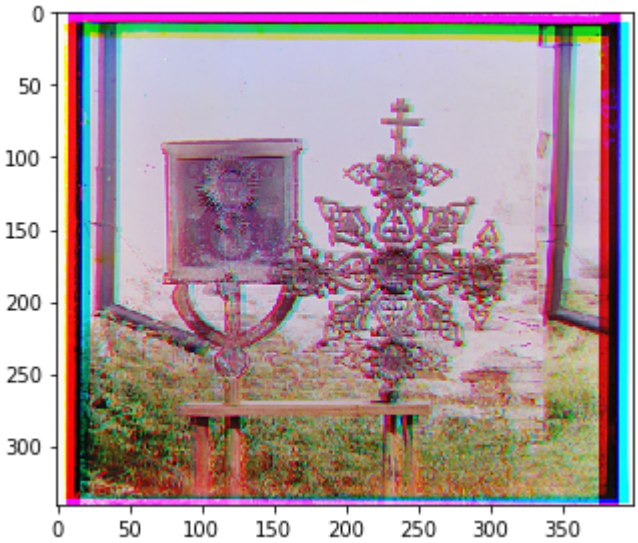
```
ims.append(imread('2.jpg'))
ims.append(imread('3.jpg'))
```

In [142]:
```
imo = []
for im in ims:
    imo.append(align(im))
```

In [143]:
```
i = 0
for im in imo:
    imsave(str(i) + '_out.png', im)
    i -=- 1
```

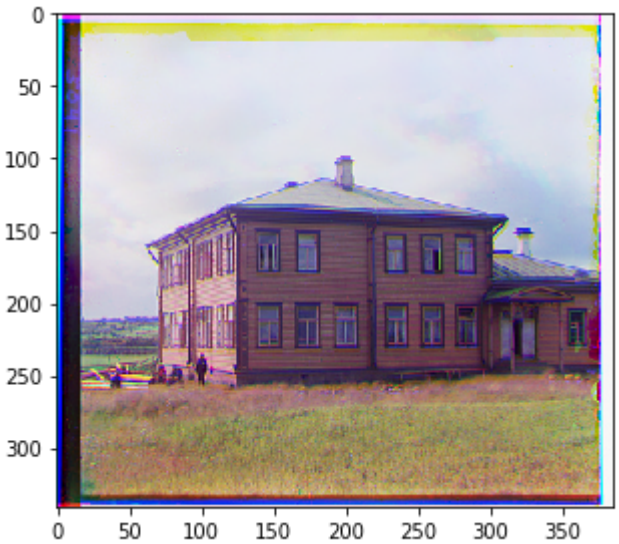
In [144]:
```
imshow(imo[0])
```

Out[144]: <matplotlib.image.AxesImage at 0x16102de30b8>



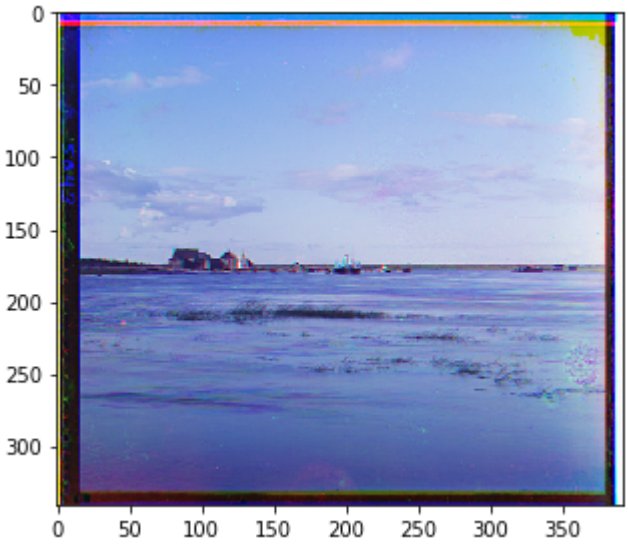
In [145]:
```
imshow(imo[1])
```

Out[145]: <matplotlib.image.AxesImage at 0x16102e29898>



In [146]:
```
imshow(imo[2])
```

Out[146]: <matplotlib.image.AxesImage at 0x16102e73048>


0
50
100
150
200
250
300
0
50
100
150
200
250
300
350