```python
[1]: import numpy as np
     import cv2
     from matplotlib import pyplot as plt
```

```python
[2]: img = cv2.imread('5d.jpg')
     b,g,r = cv2.split(img)
     rgb_img = cv2.merge([r,g,b])
```

```python
[3]: gray = cv2.cvtColor(img,cv2.COLOR_BGR2GRAY)
     ret, thresh = cv2.threshold(gray,0,255,cv2.THRESH_BINARY_INV+cv2.THRESH_OTSU)
```

```python
[7]: # noise removal
     kernel = np.ones((2,2),np.uint8)
     opening = cv2.morphologyEx(thresh,cv2.MORPH_OPEN,kernel, iterations = 2)
     closing = cv2.morphologyEx(thresh,cv2.MORPH_CLOSE,kernel, iterations = 2)
```

```python
[8]: # sure background area
     sure_bg = cv2.dilate(closing,kernel,iterations=3)
```

```python
[11]: plt.subplot(221),plt.imshow(rgb_img)
      plt.title('Input Image'), plt.xticks([]), plt.yticks([])
      plt.subplot(222),plt.imshow(thresh, 'gray')
      plt.title("Otus's binary threshold"), plt.xticks([]), plt.yticks([])
      plt.subplot(223),plt.imshow(closing, 'gray')
      plt.title("morphology"), plt.xticks([]), plt.yticks([])
      plt.subplot(224),plt.imshow(sure_bg, 'gray')
      plt.title("Dilation"), plt.xticks([]), plt.yticks([])
      plt.show()
```