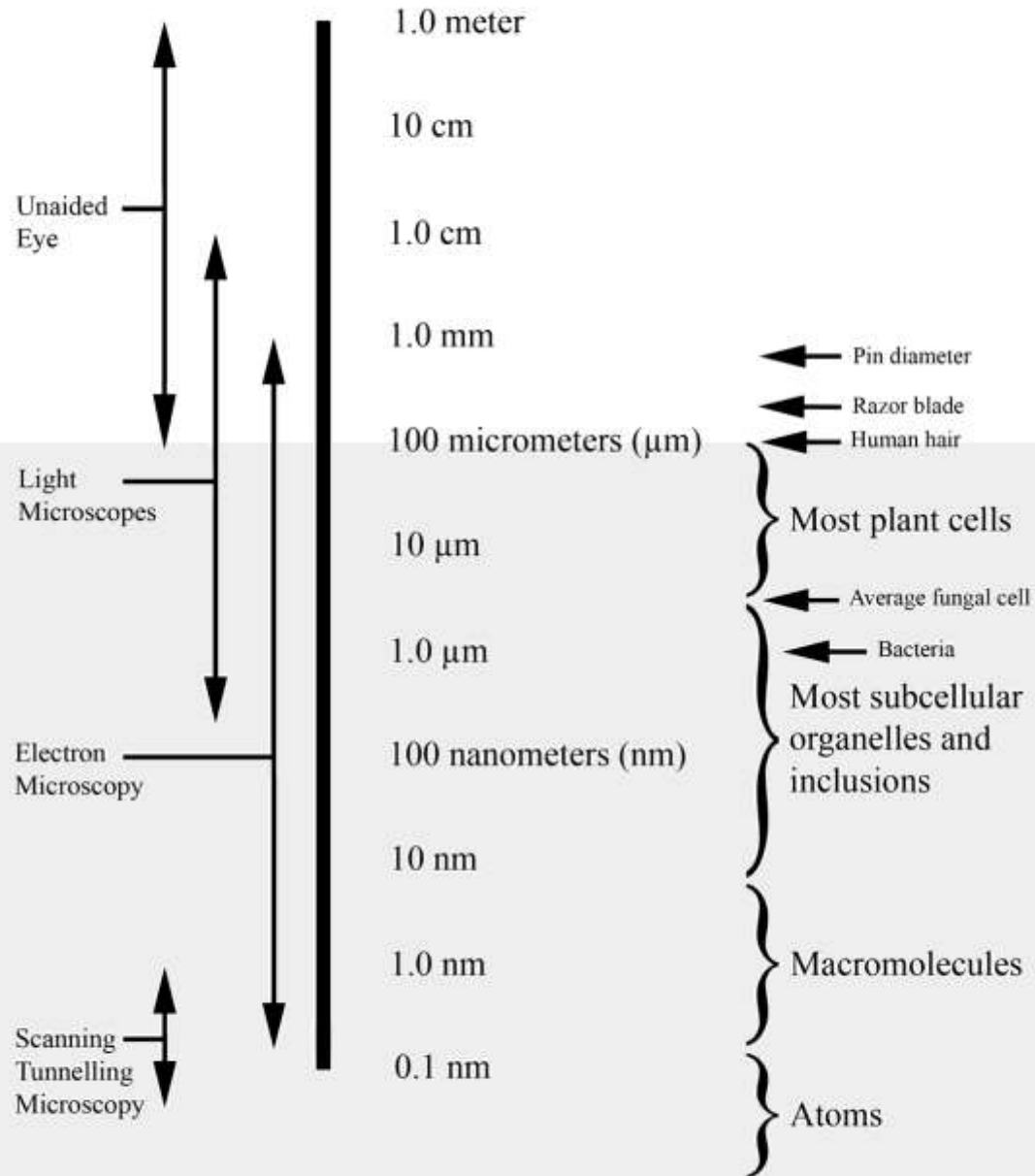
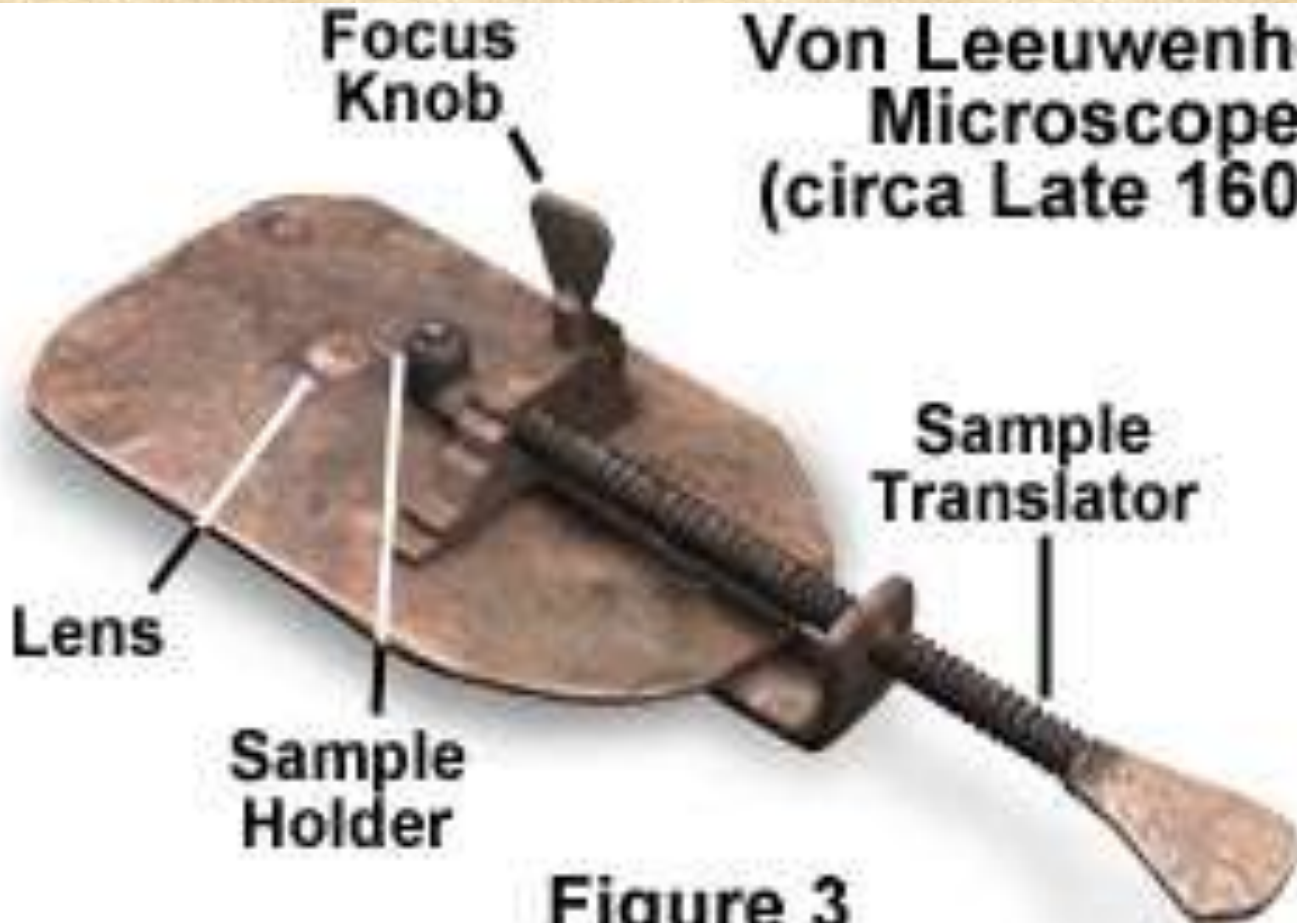


# MAGNIFICATION AND SCALE CHART

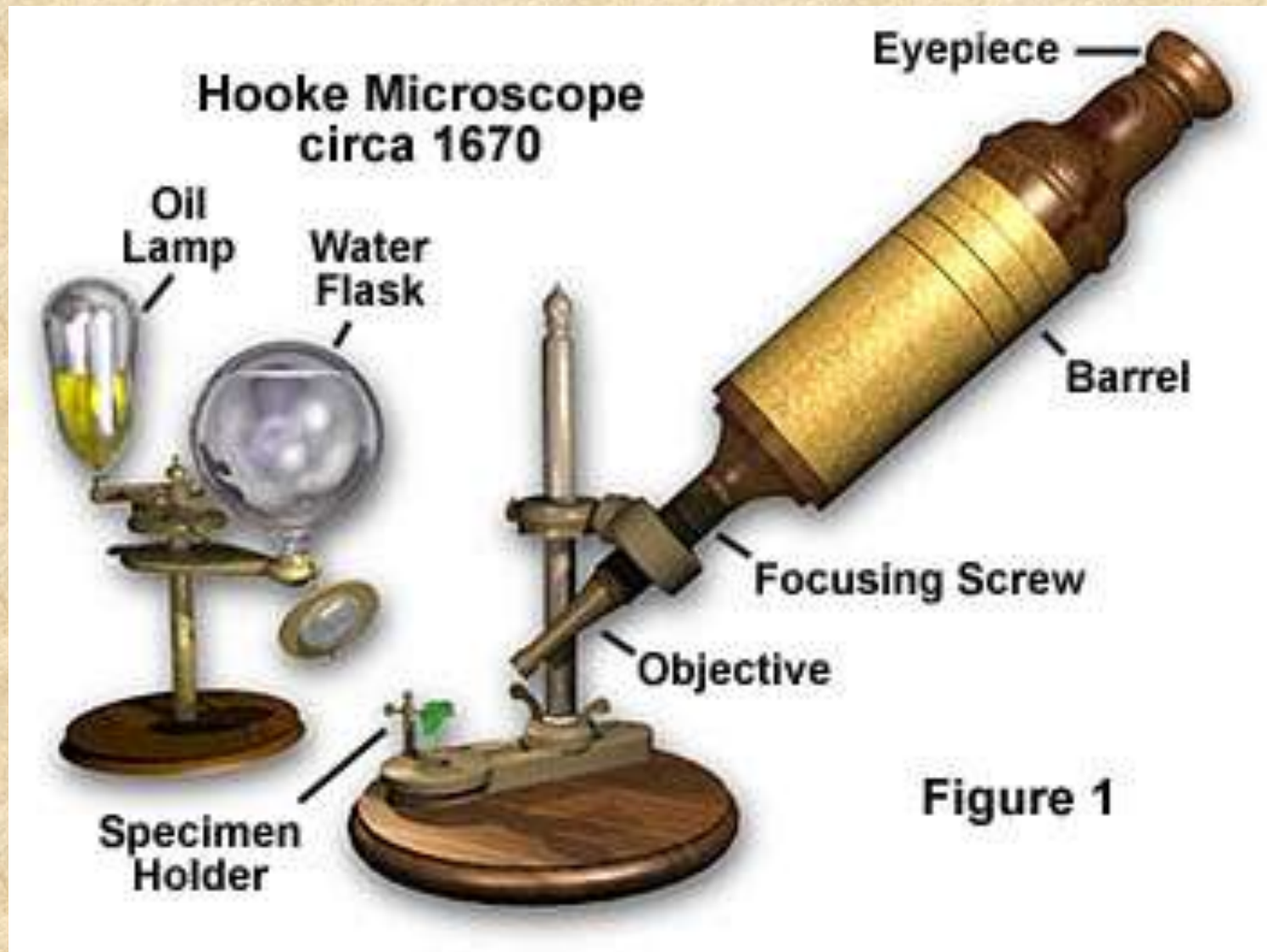


**Von Leeuwenhoek  
Microscope  
(circa Late 1600s)**



**Figure 3**

# Microscopes - 1670



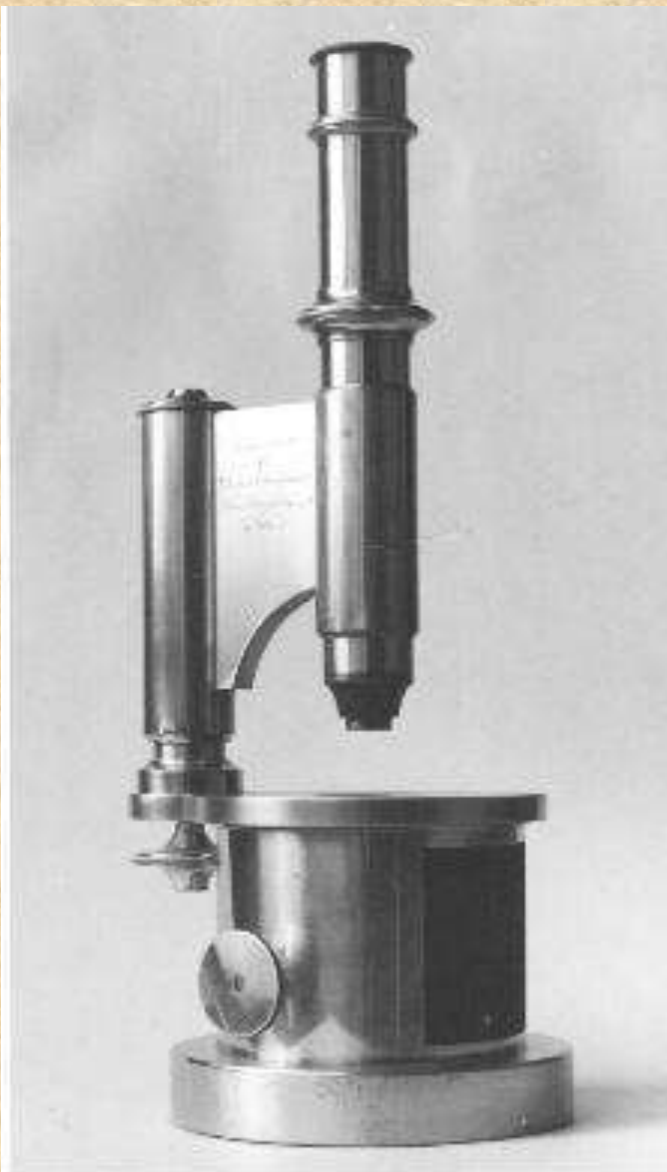


Fig. 8. Oberhäuser microscope,  
circa 1845.

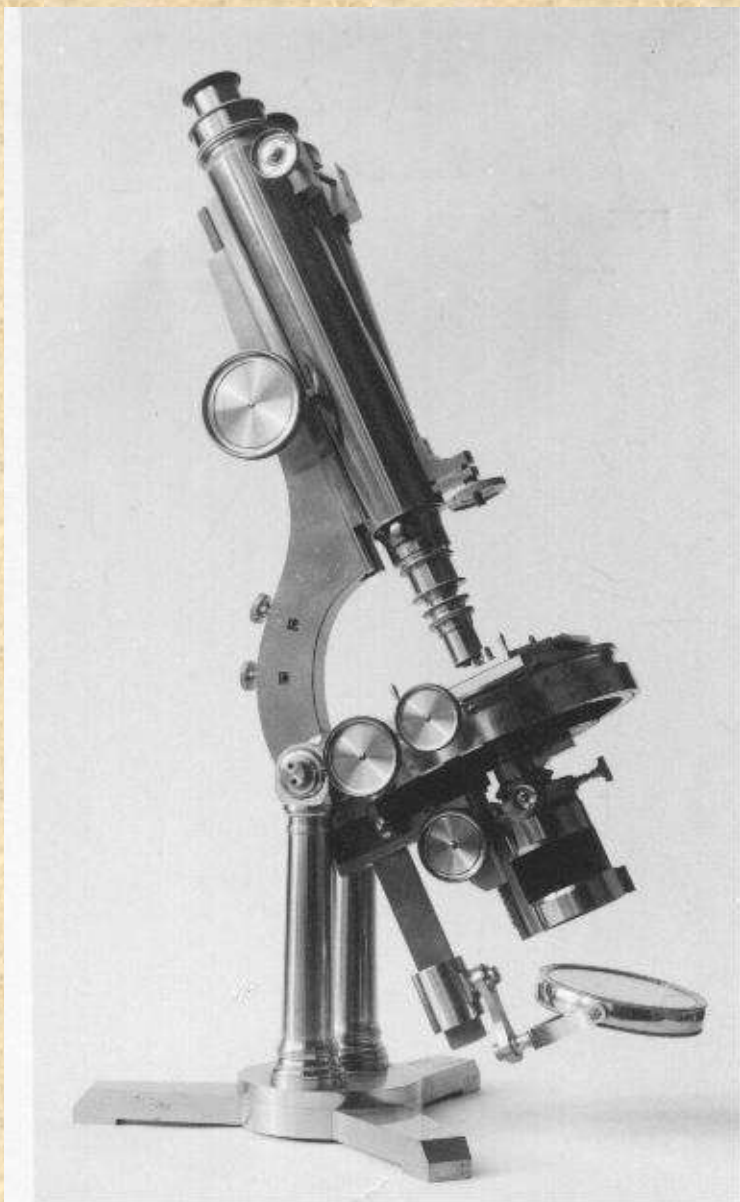


Fig. 7. Beck microscope, 1875

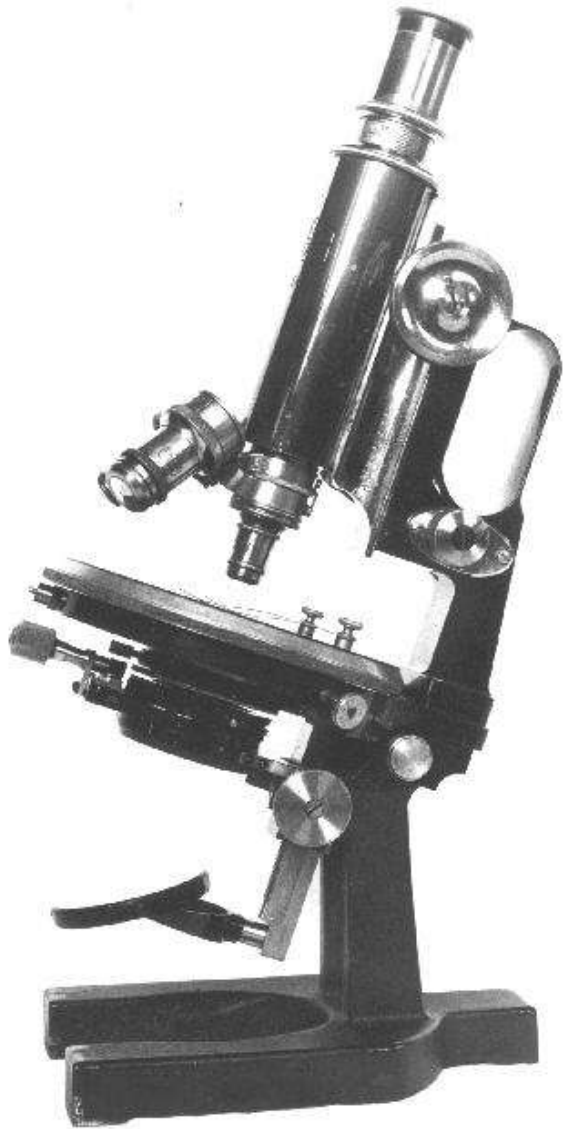


Fig. 9. Classic Zeiss stand, 1912

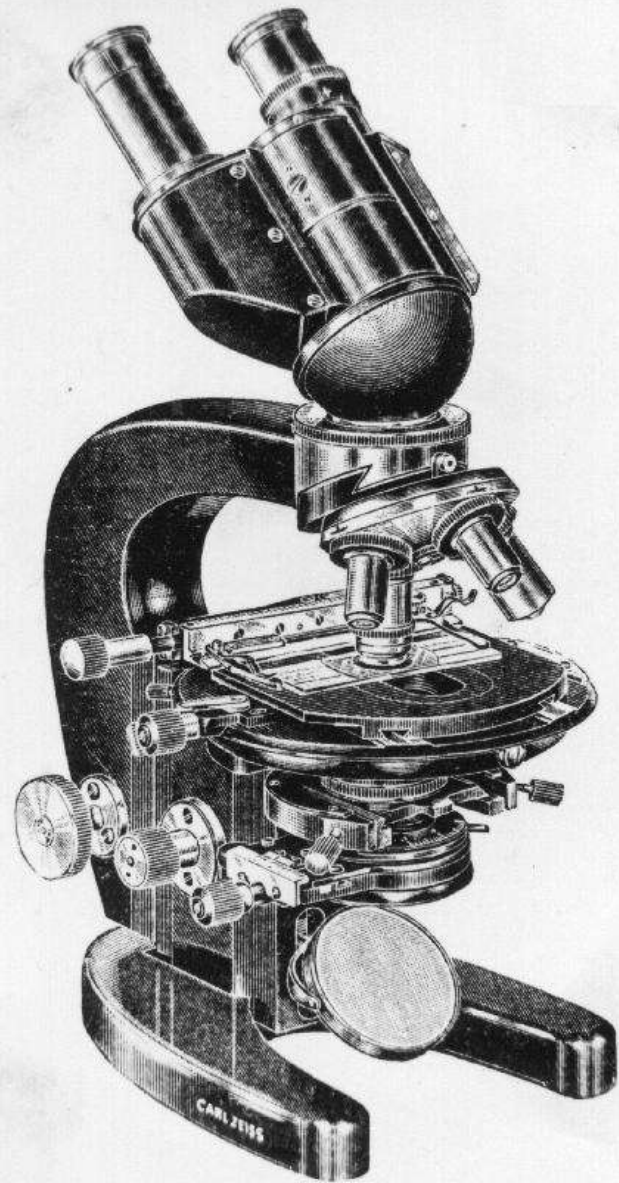
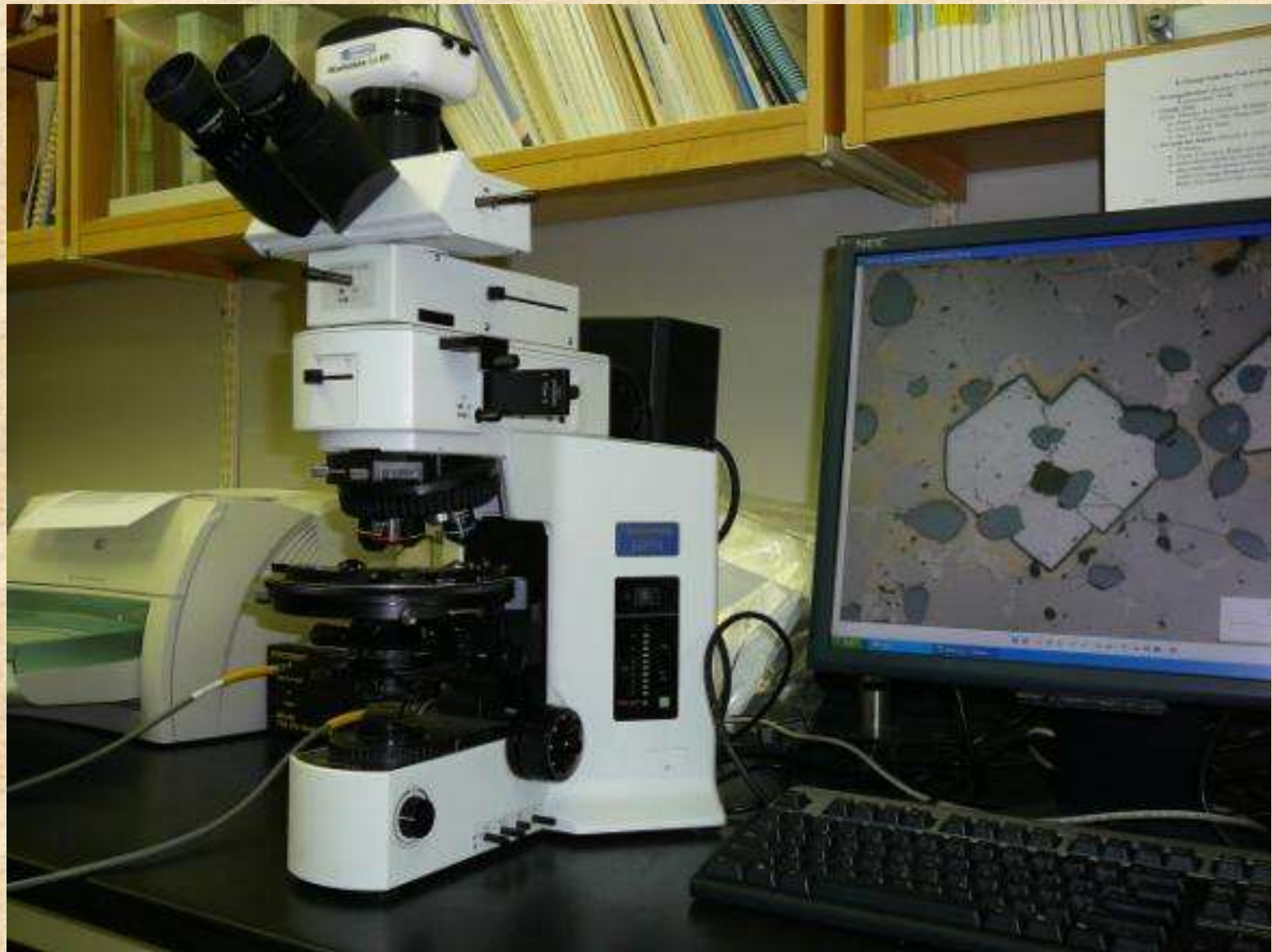
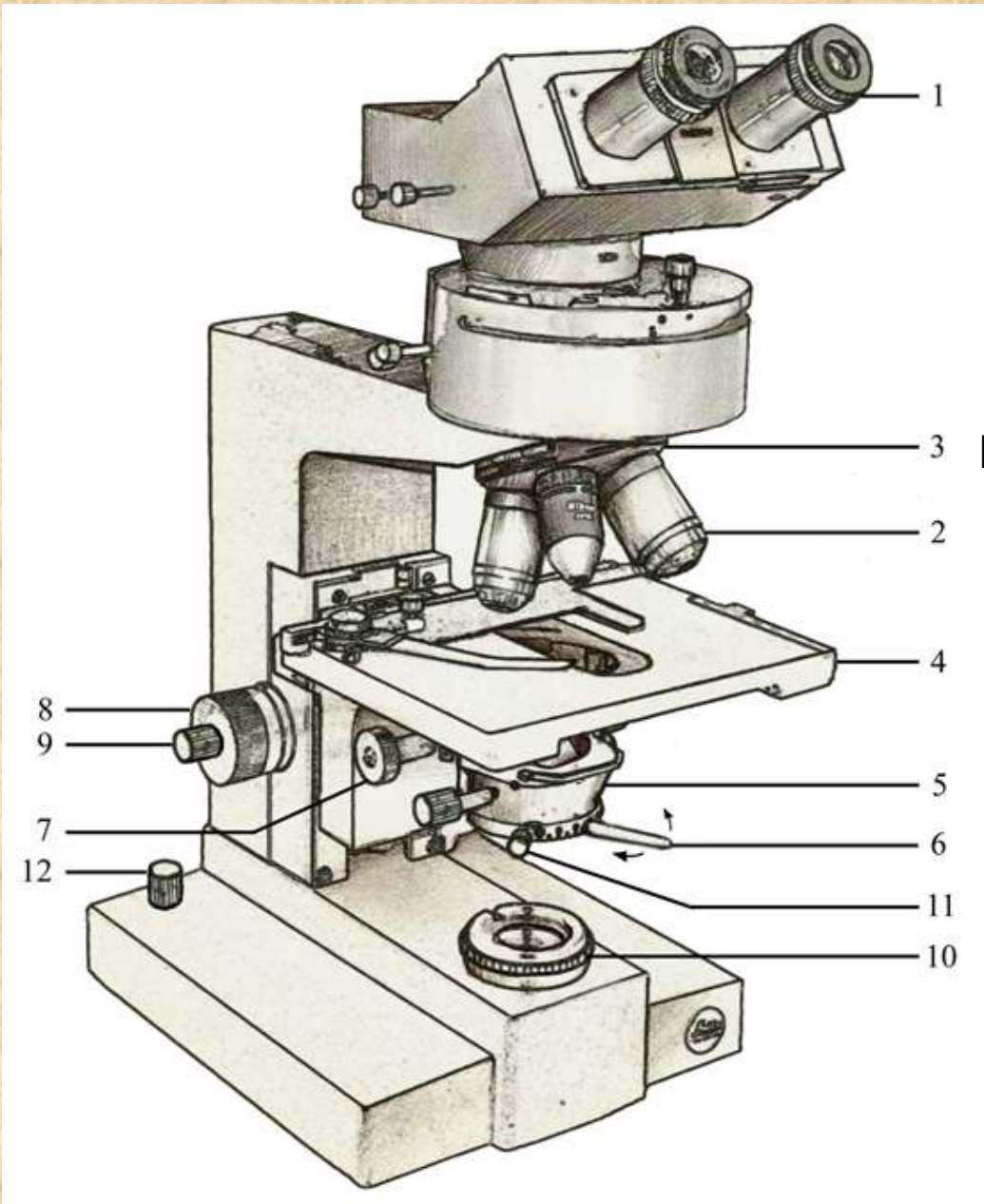


Fig. 10. The Zeiss L model (1933) set the pattern for the next decades (courtesy Zeiss)





1 Eyepieces

3 Nosepiece

2 Objective lenses

4 Stage

5 Condenser

6 Iris aperture

11 Centering screws

10 Field diaphragm

8 Focus

9 Condenser adjustment

8

9

7

12

1

3

2

4

5

6

11

10

# 60x Plan Apochromat Objective

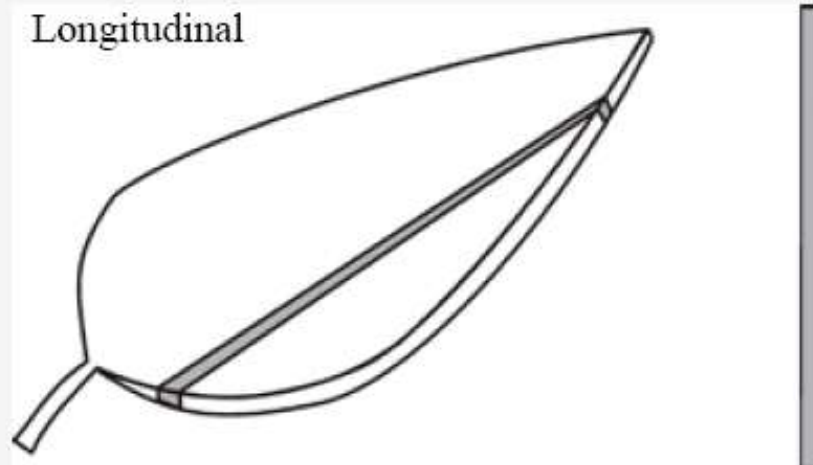
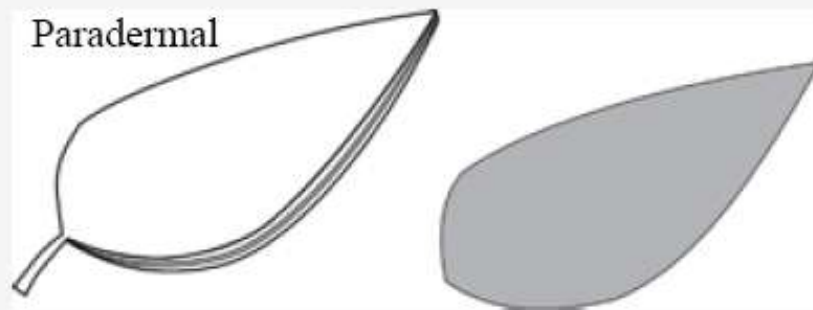
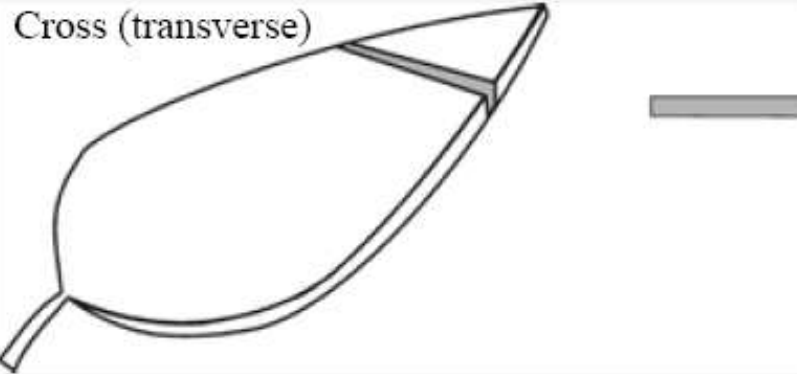


Figure 1



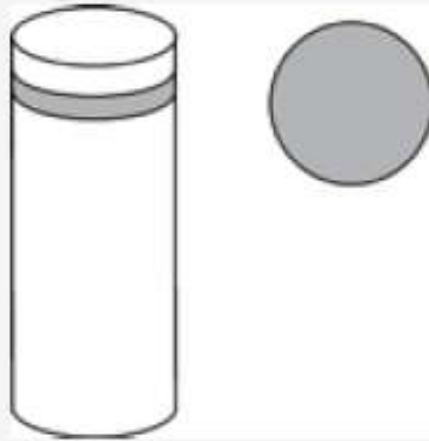


**In flat organs such as leaves and petals, three types of sections are possible:**

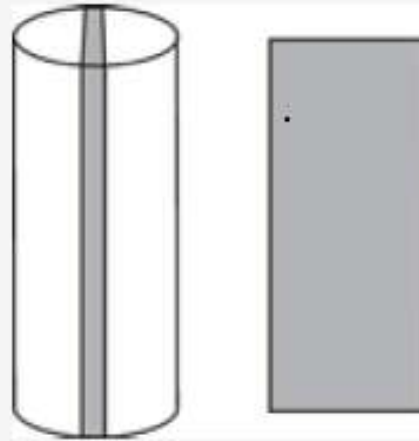


**In columnar organs such as stems and roots,  
the following types of sections can be made:**

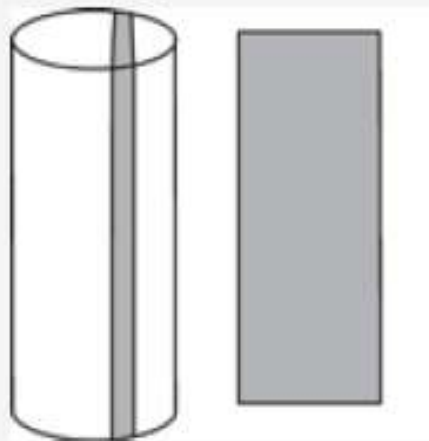
Cross (transverse)



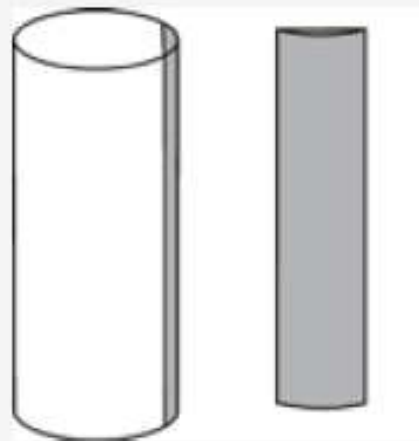
Radial longitudinal

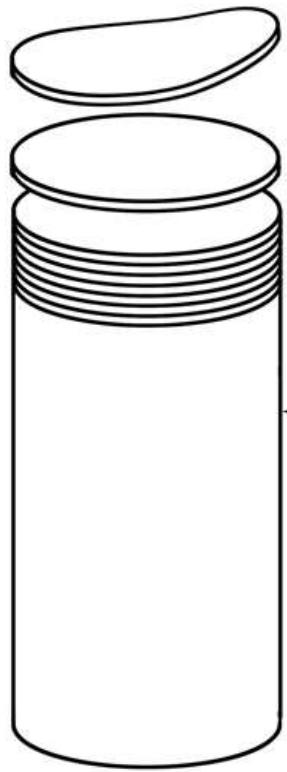


Tangential longitudinal



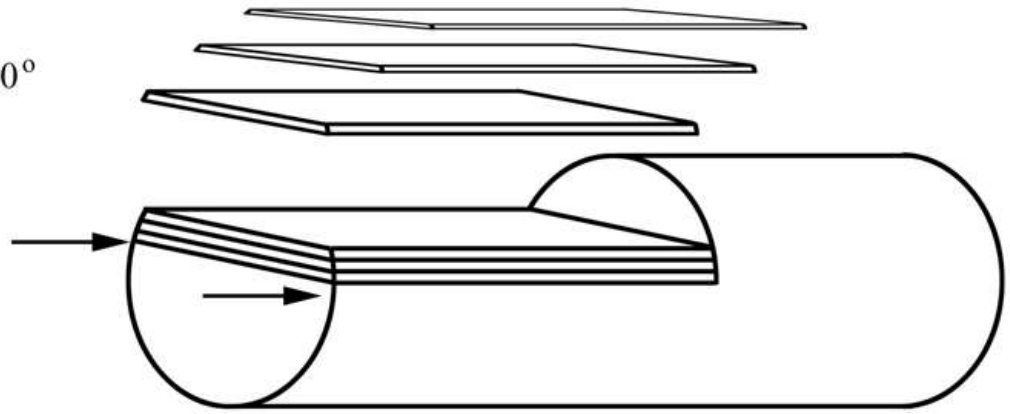
Paradermal





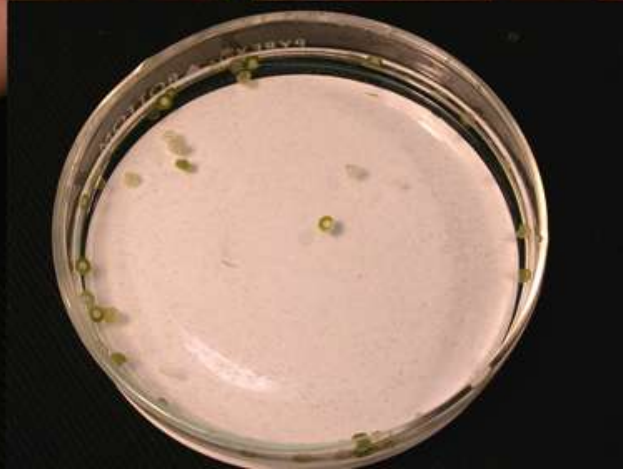
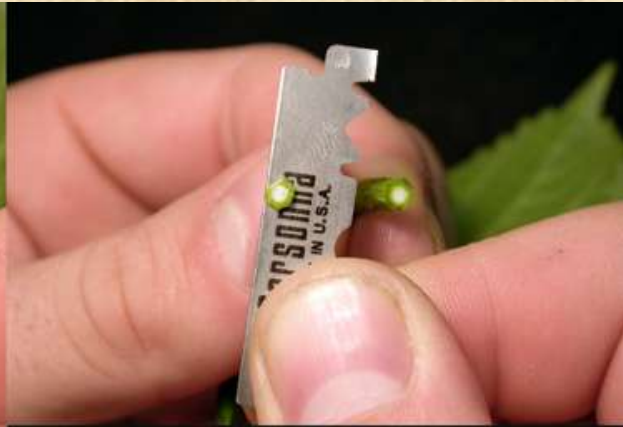
(A)

← 90°

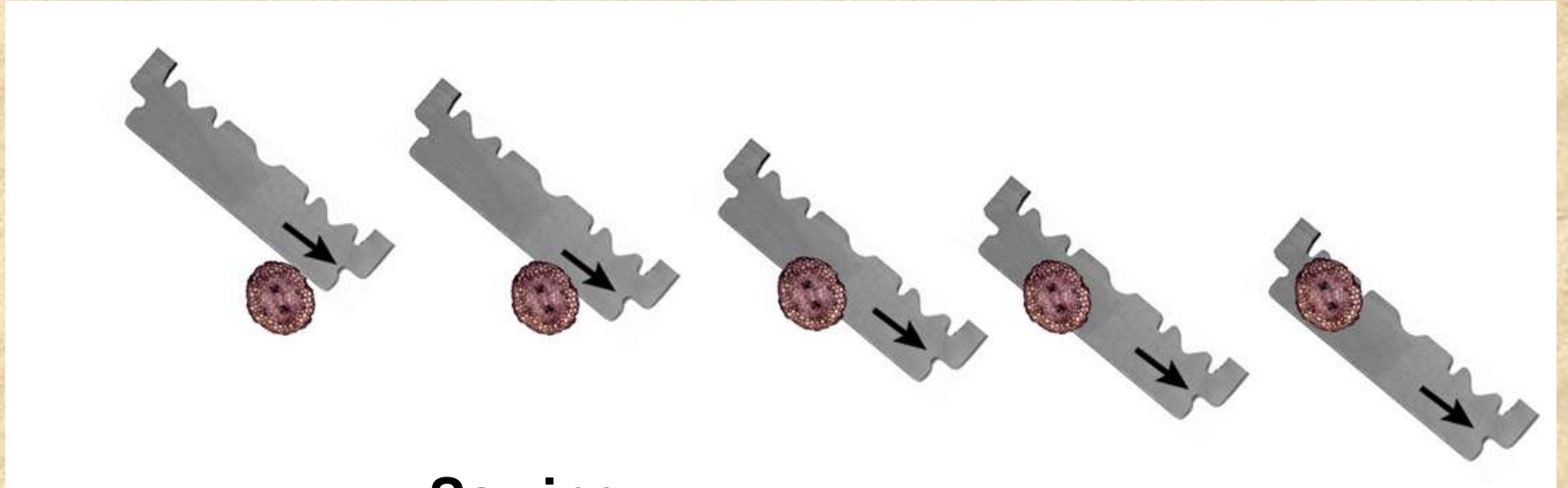


(B)

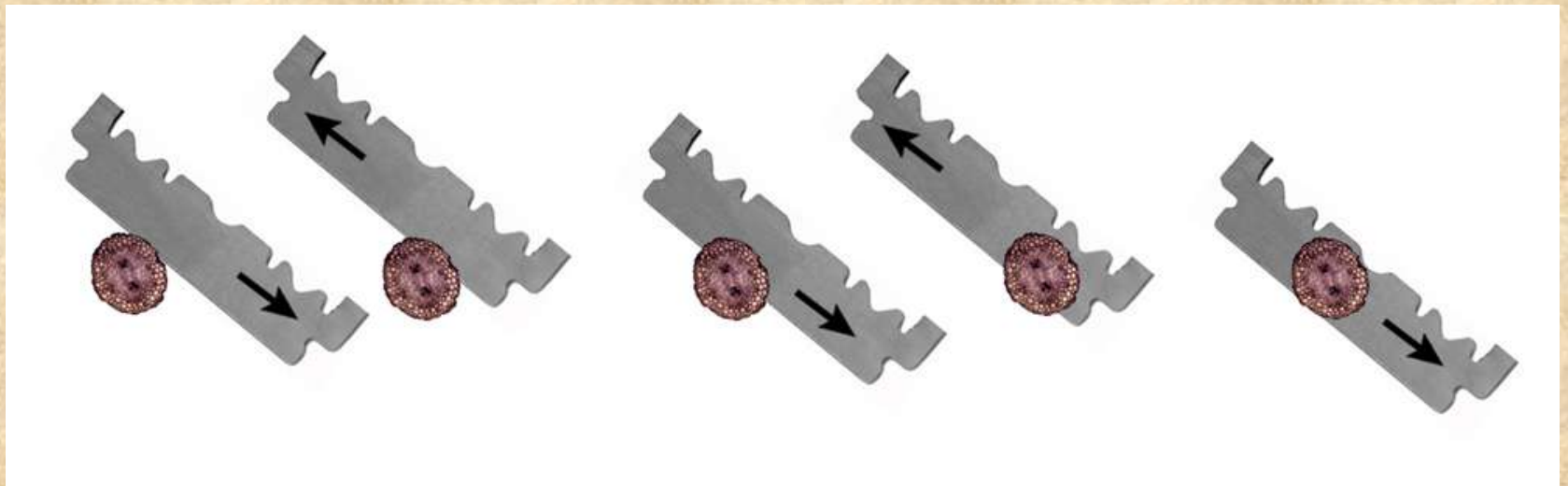


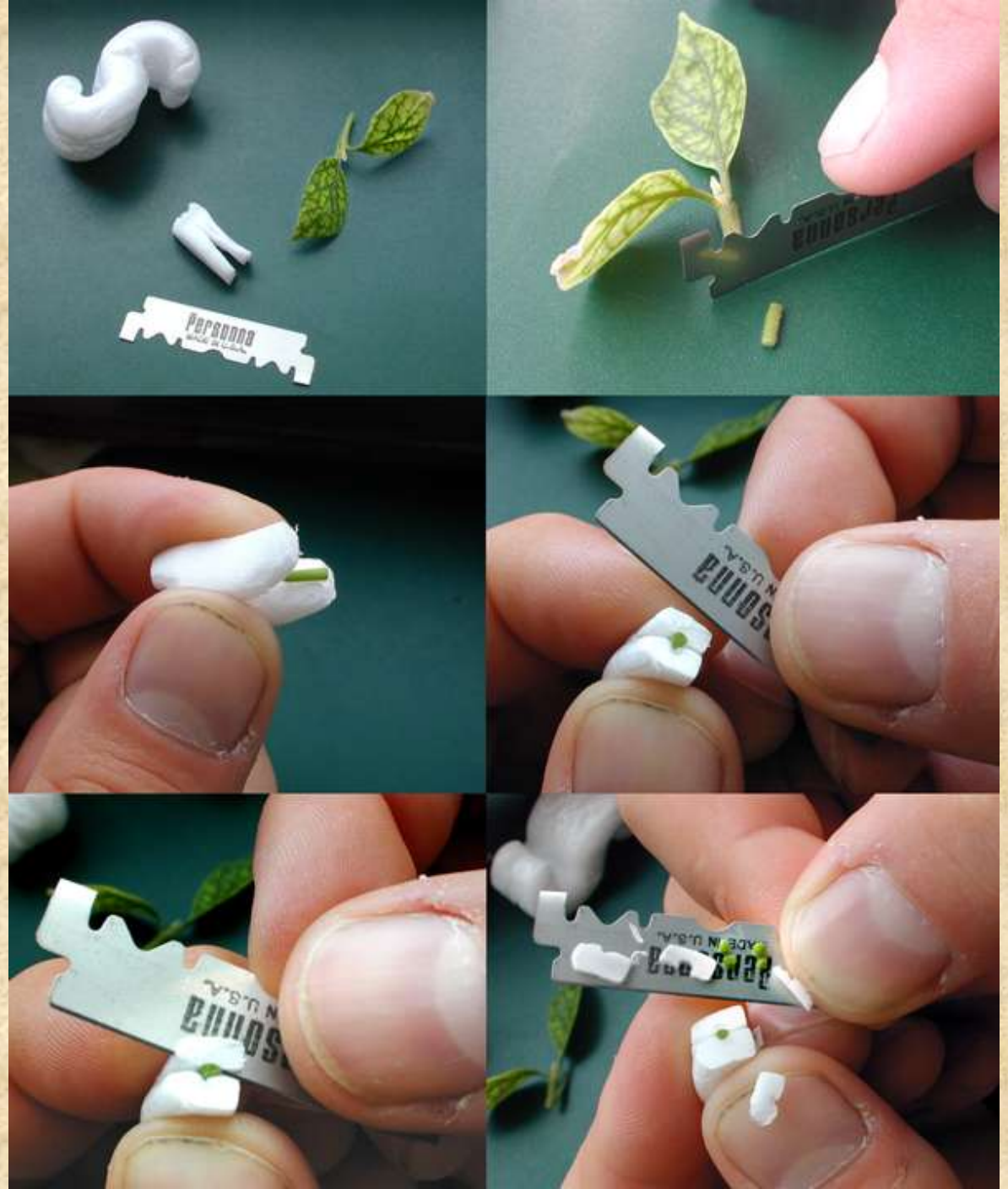
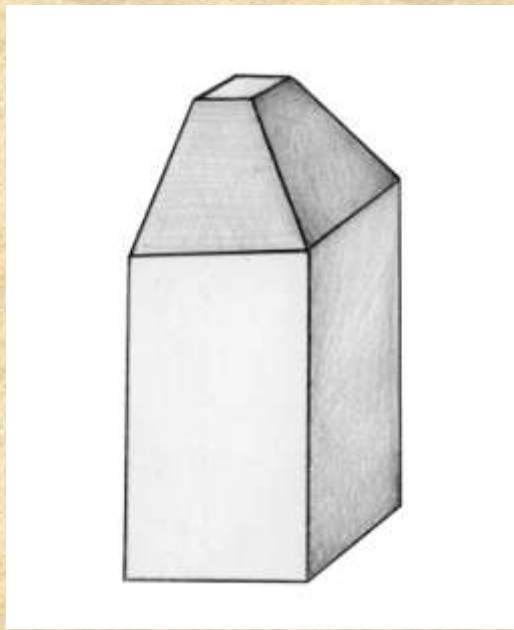


## Slicing



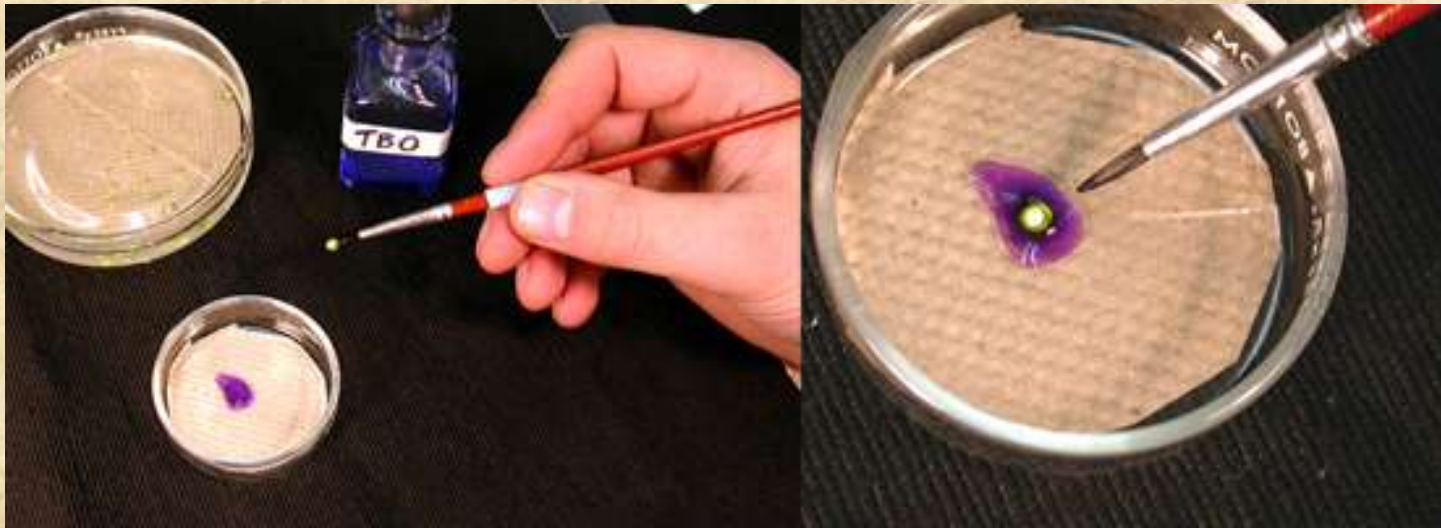
## Sawing



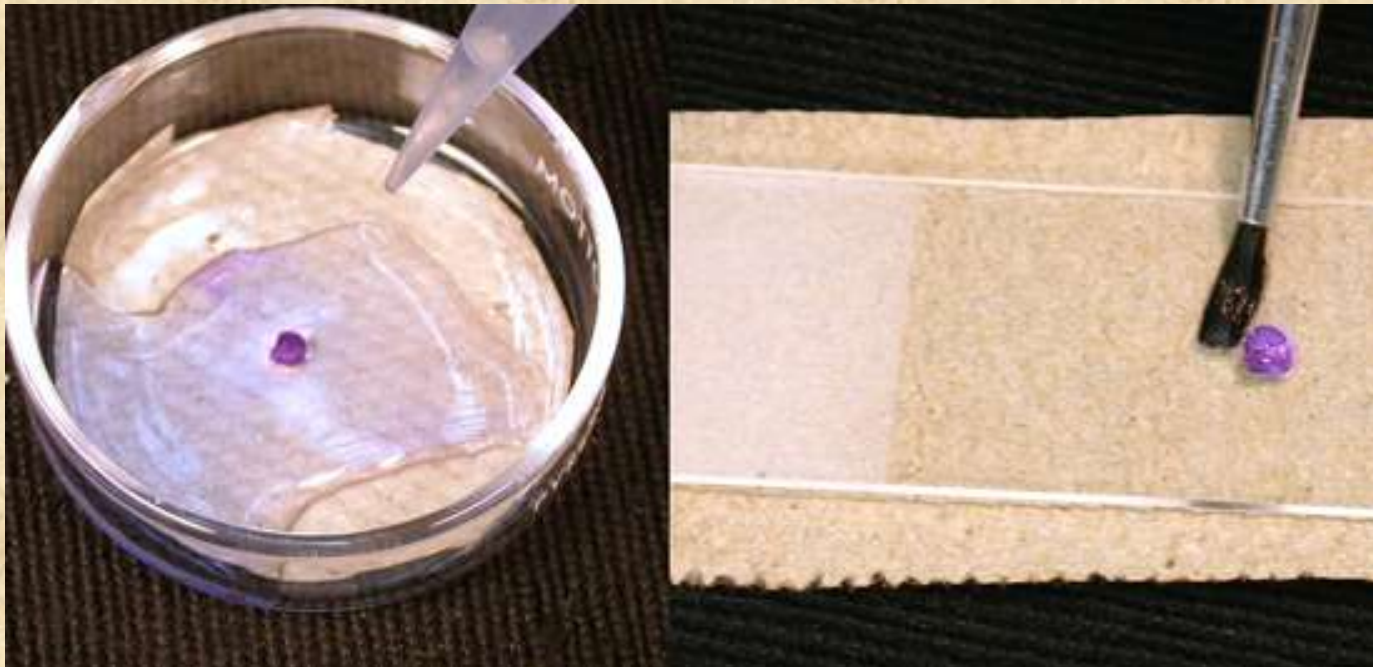


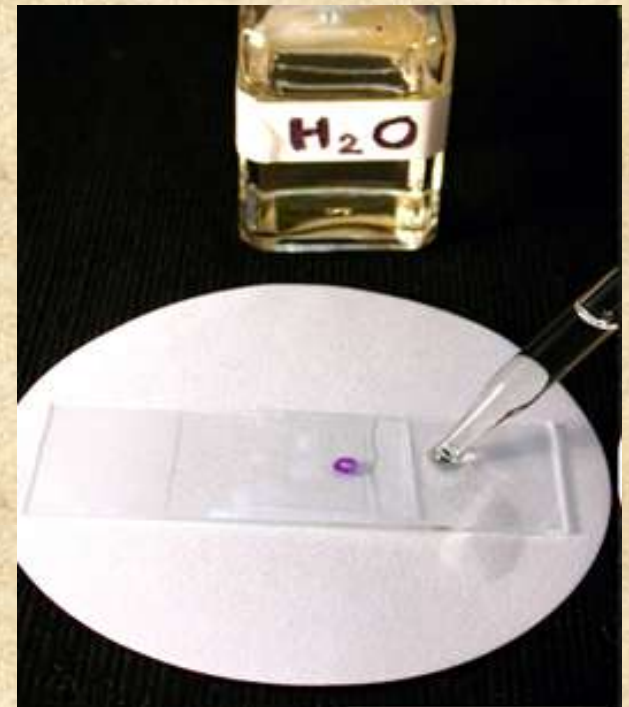
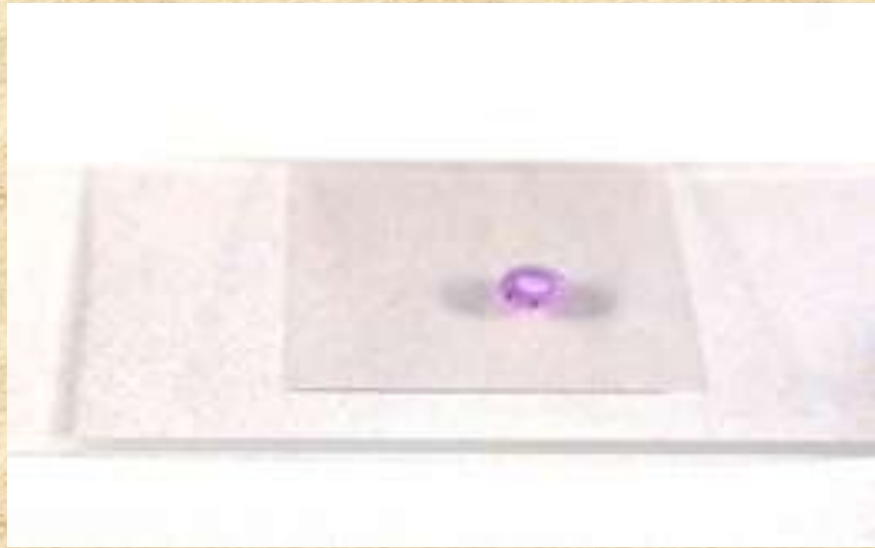


## Staining



## Washing





# Stains for Cell Components and organelles

## Cellulose Cell in Walls

Fast green

Bismarck Brown

Acid Fuchsin

## Lignified Cell Walls

Safranin

Crystal Violet

## Cutinized Cell Walls

Safranin

Crystal Violet

Acid Fuchsin

## Middle Lamella

Iron Haematoxylin

## Chromosomes

Safranin

Crystal Violet

Carmin

Orcine

## Mitochondria

Iron hematoxylin

Acid Fuchsin

Crystal Violet

## Plastids

Crystal Violet

## Proteins

Safranin

## Lipids

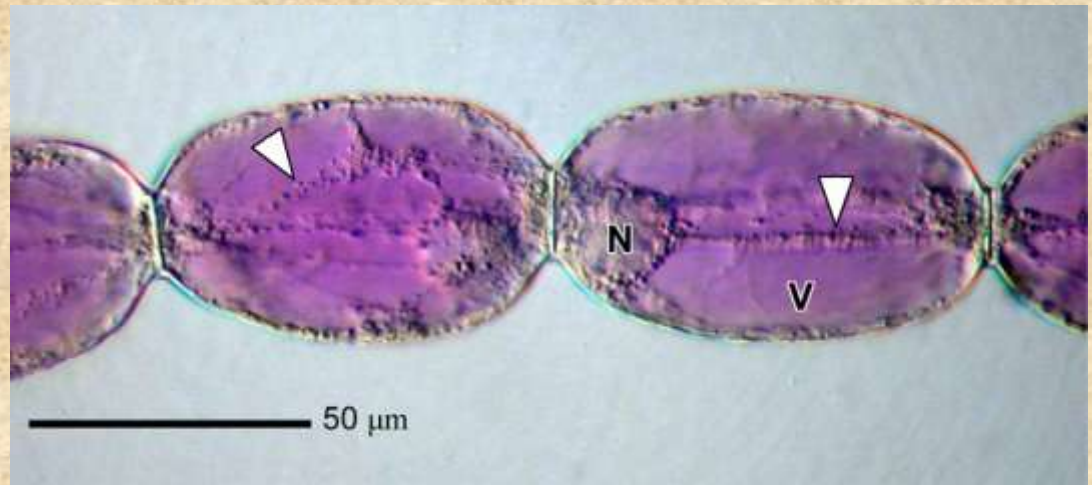
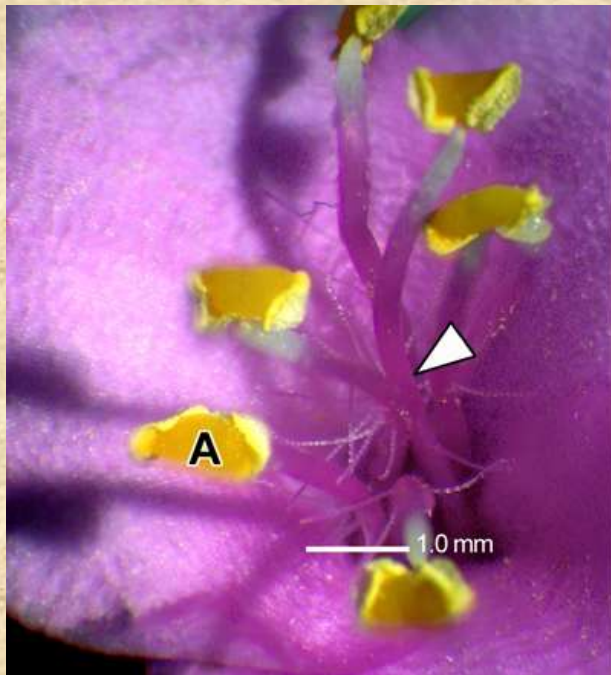
Sudan III, IV

## Cytoplasm

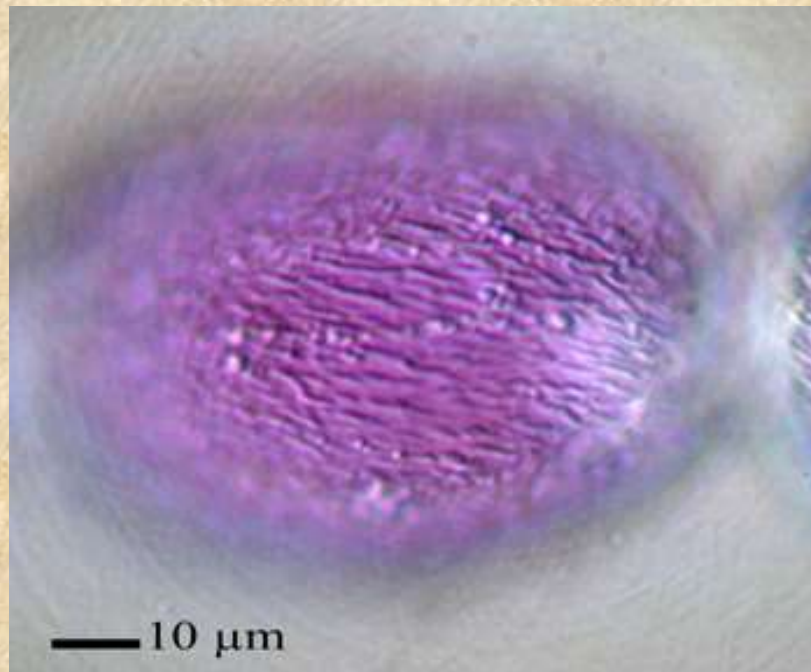
Eosin Y

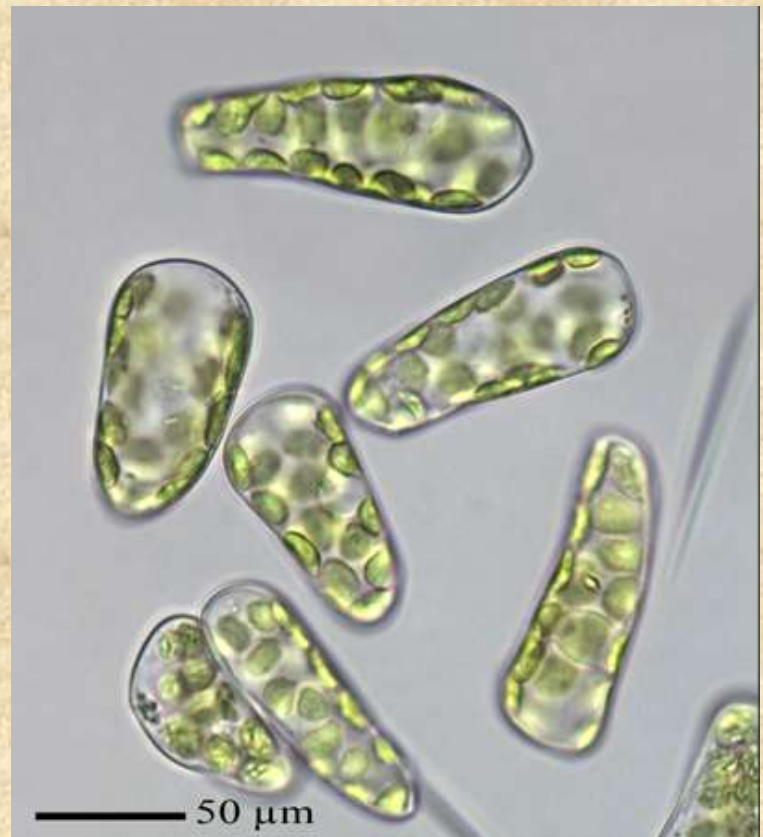
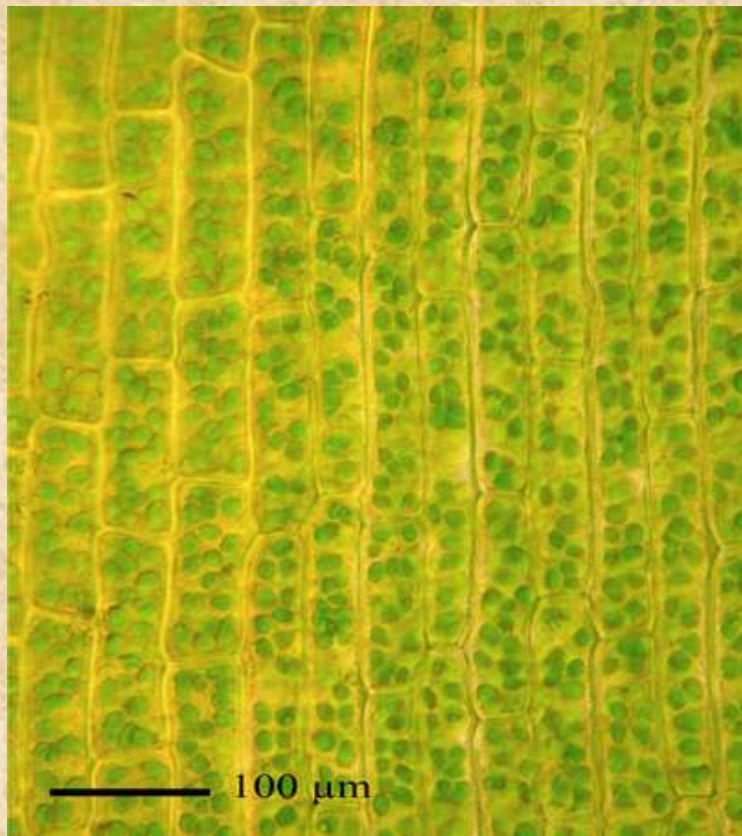
Erythrosin B

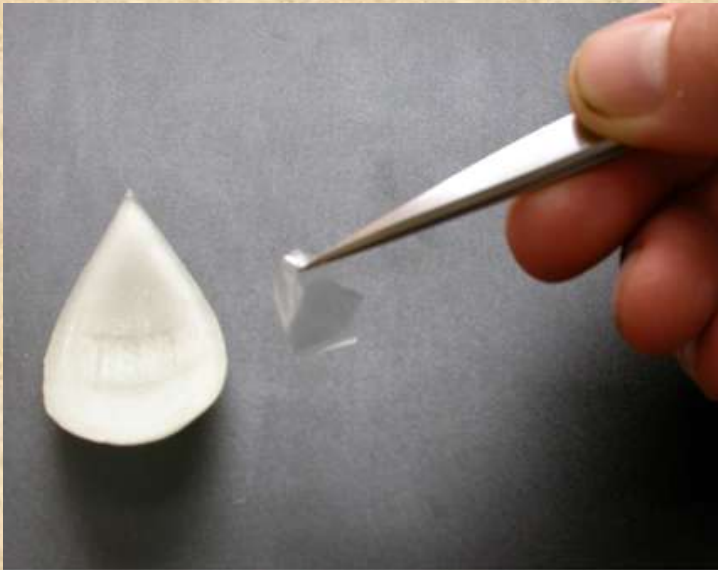
Fast Green



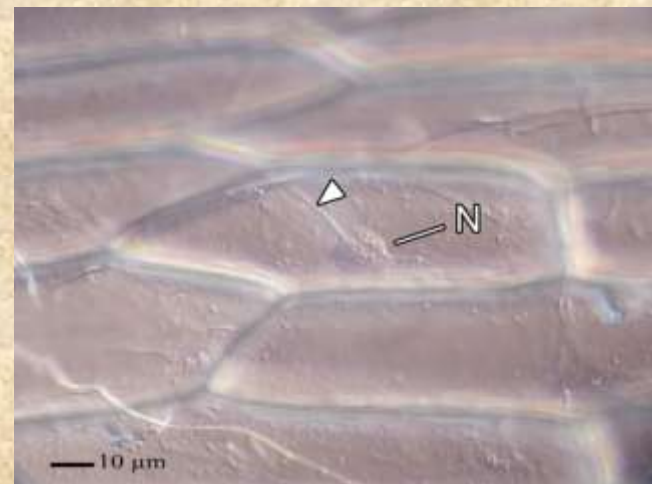
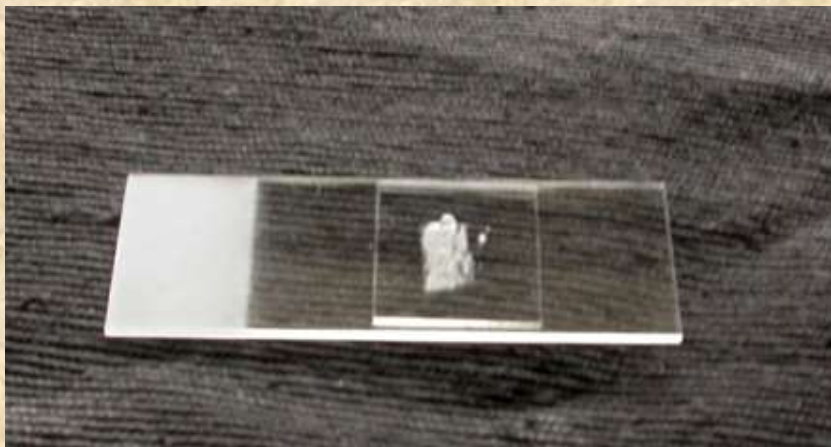
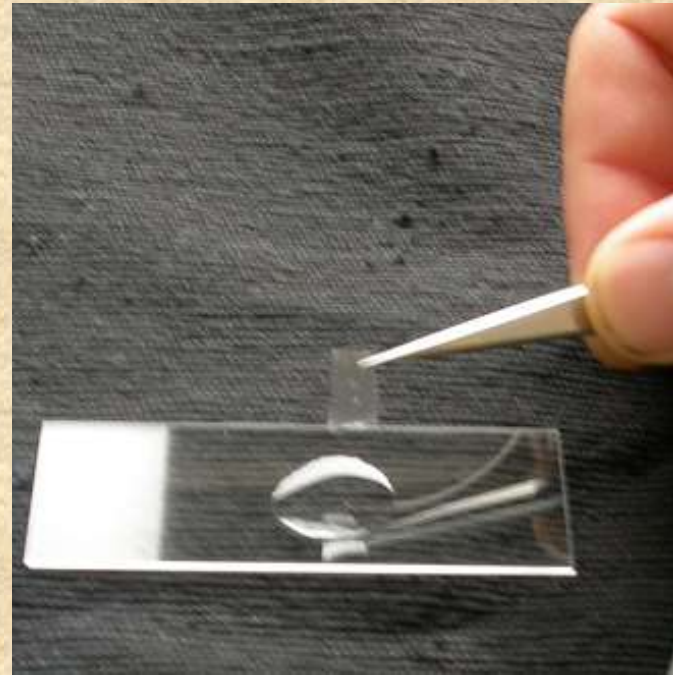
## Tradescantia



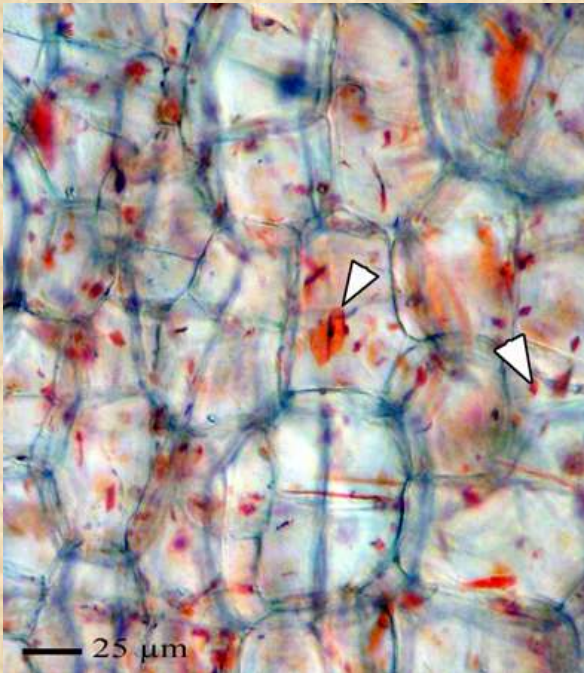




Onion



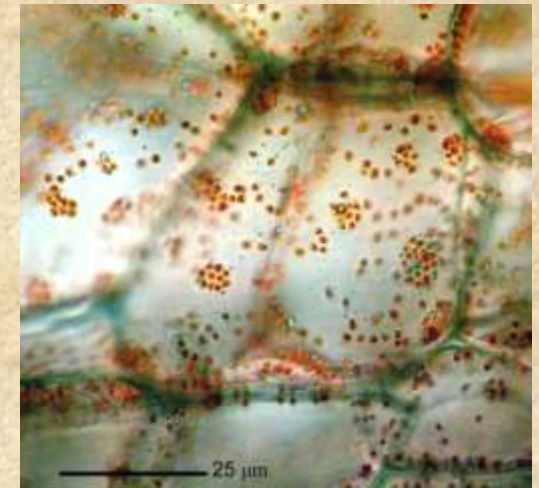
# Chromoplasts



Carrot

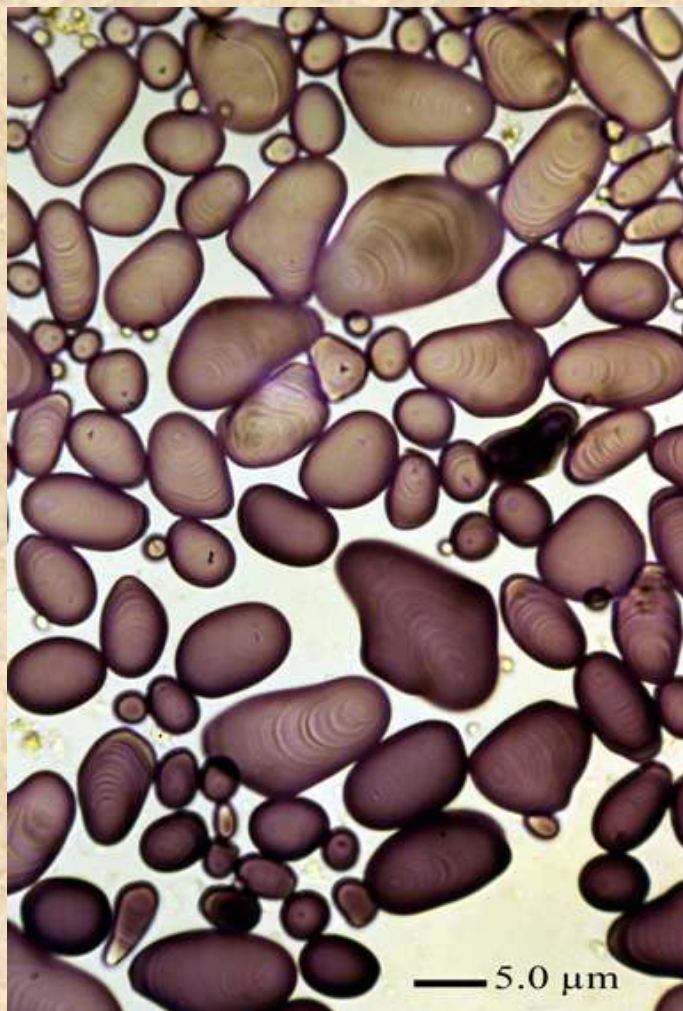


Bird-of-Paradise



Red Pepper

## Starch Grains - IKI



Potato



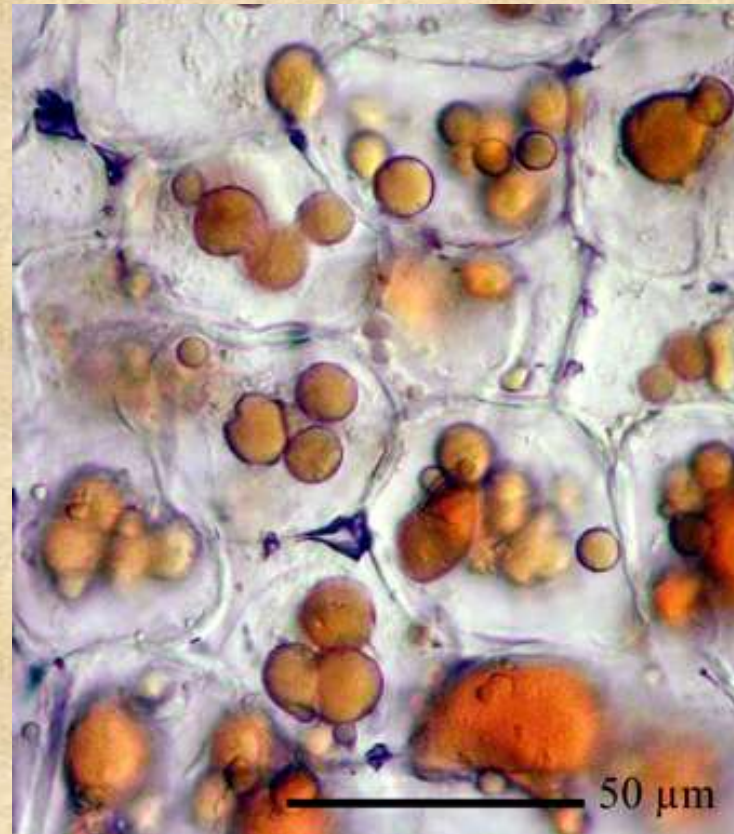
Bean seed



## Lipids – Sudan III

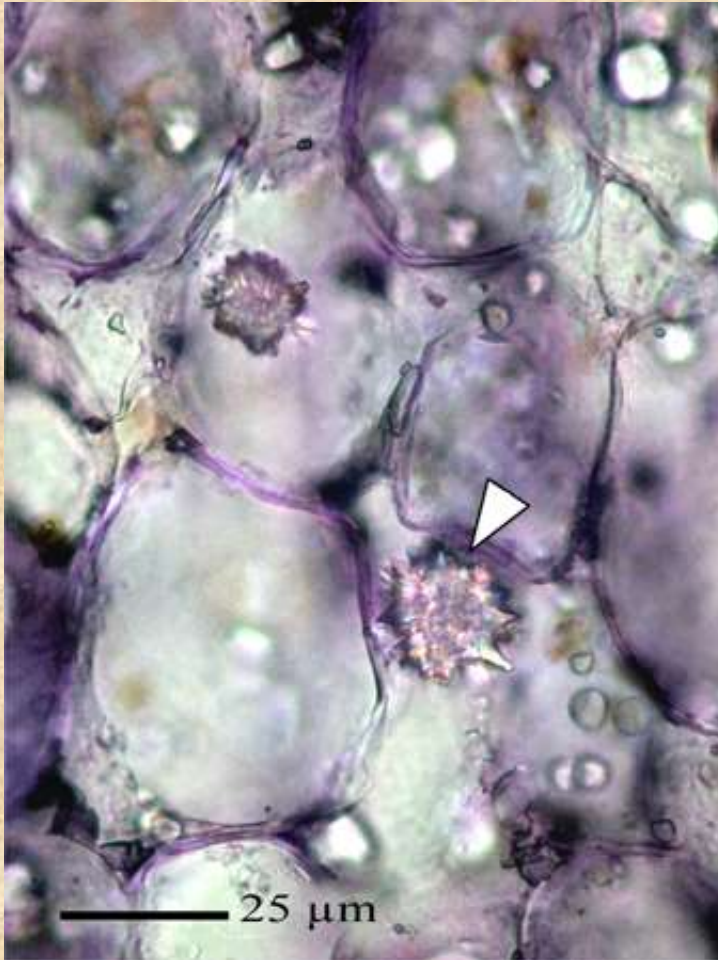


Sunflower Seed



Avacado

## Calcium Oxalate Crystals



Druse – sweet potato



Raphide Bundle - Impatiens