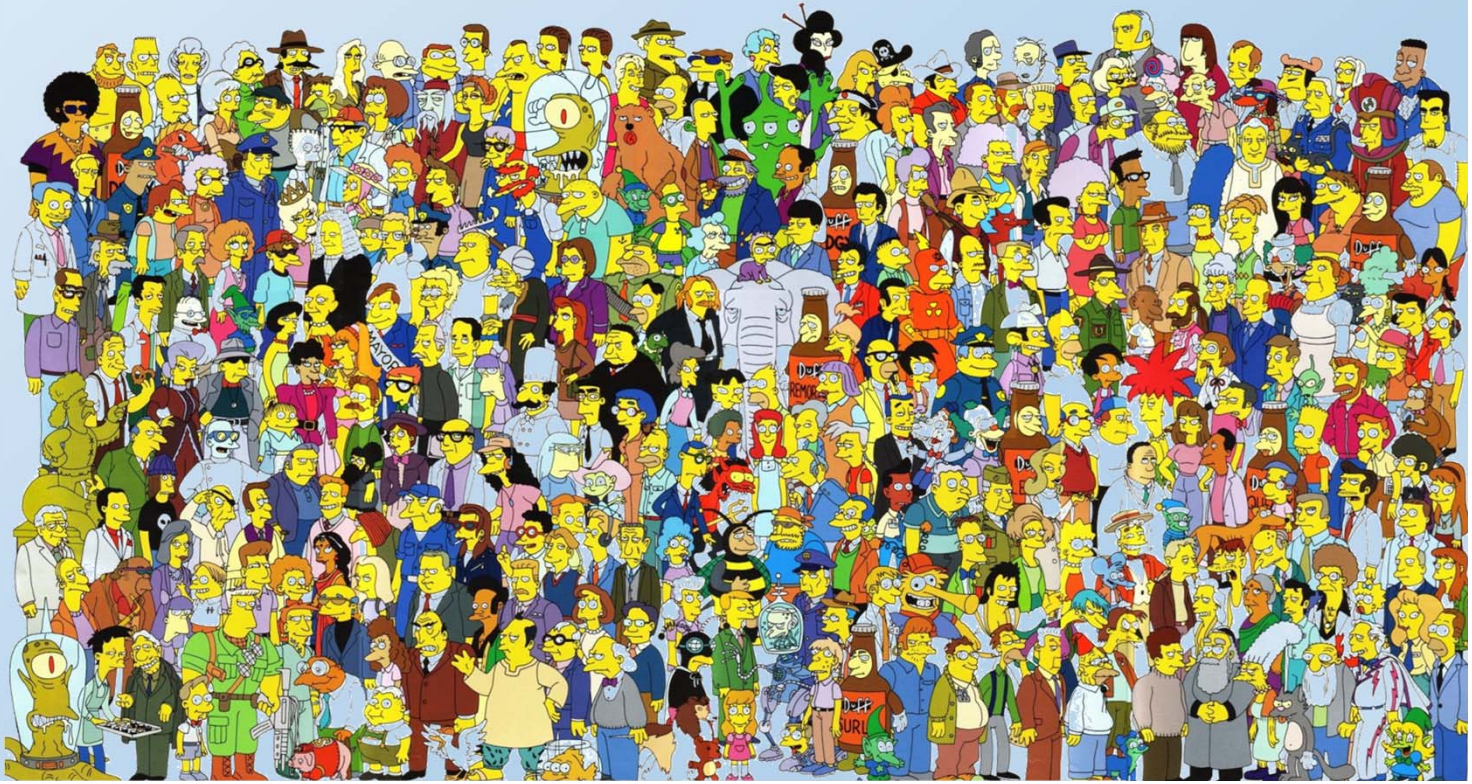
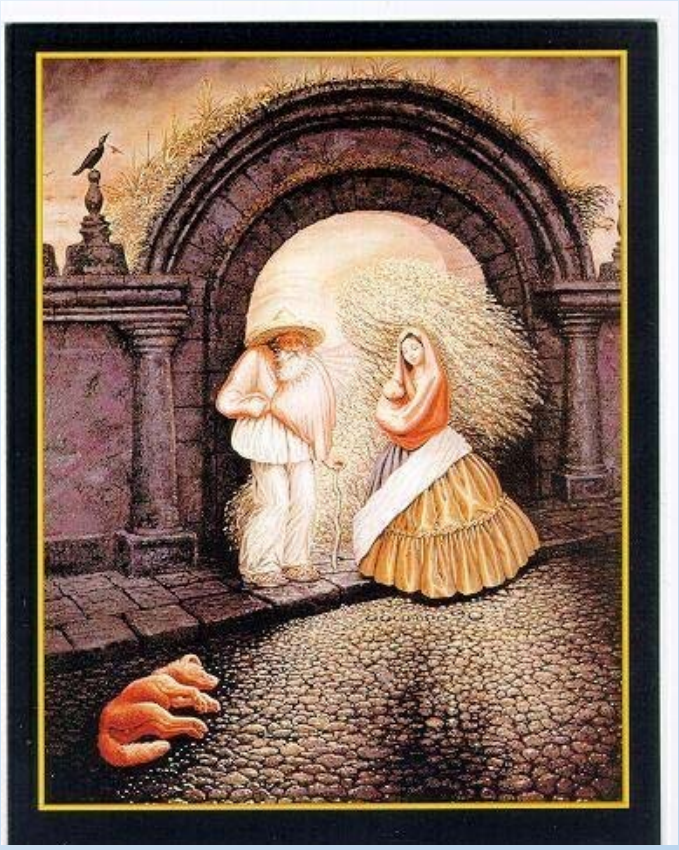
视觉知觉

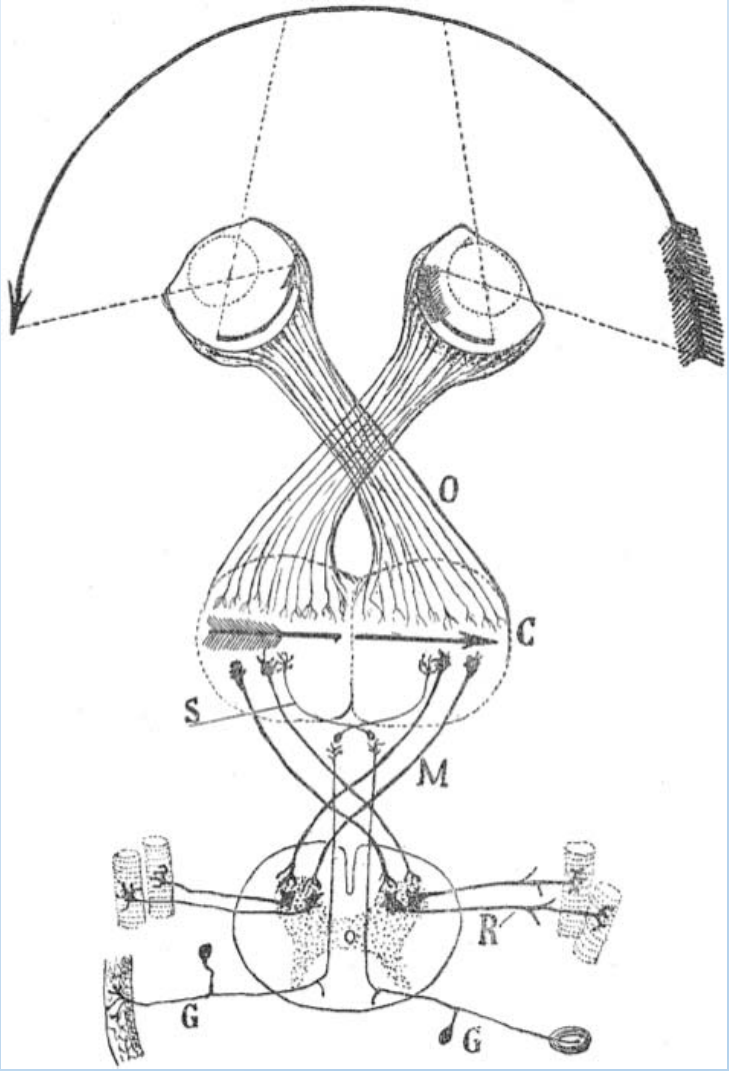


从视网膜影像，到意识形态

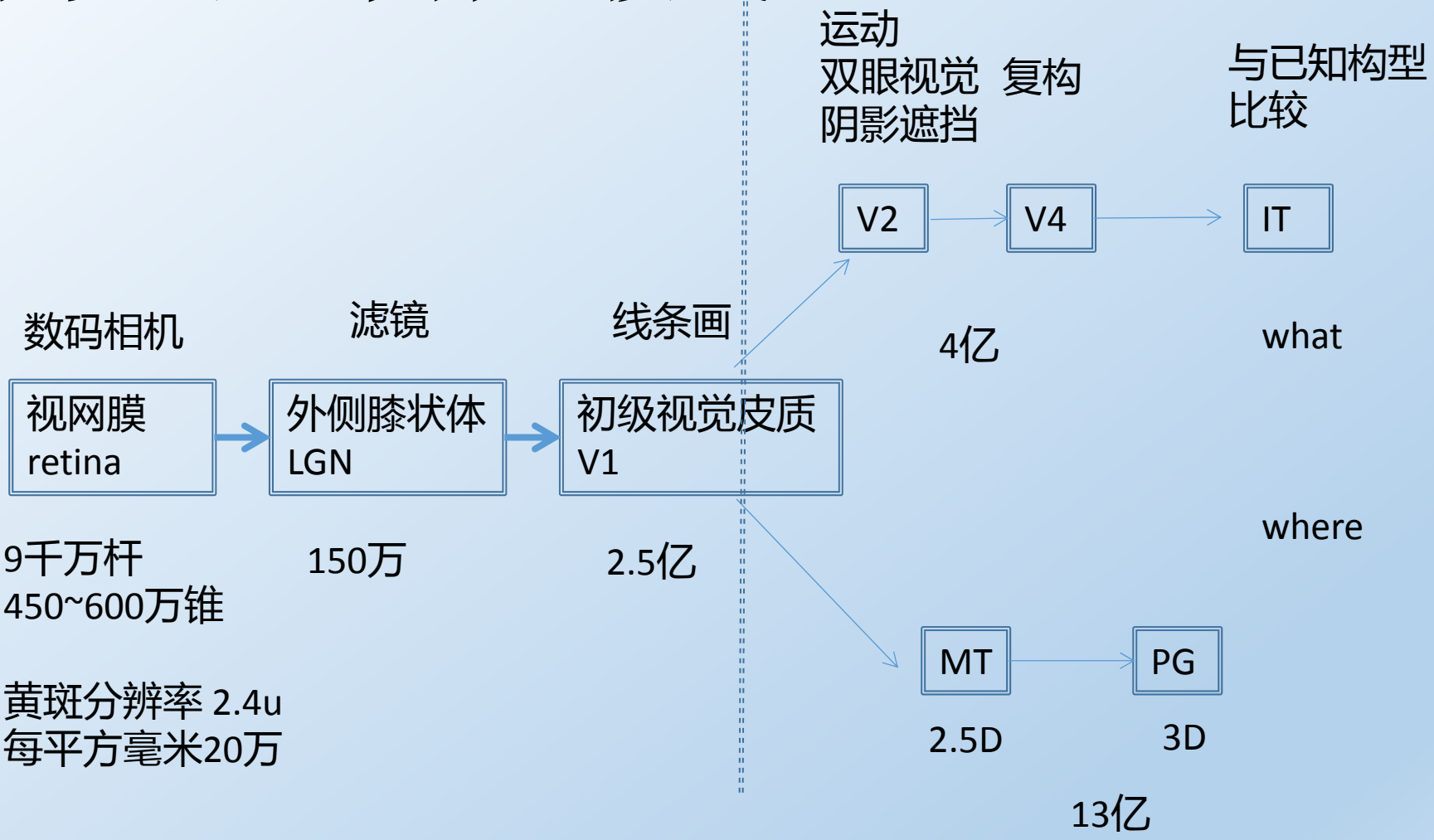


simultagnosia

首先，回顾一下视觉的硬件

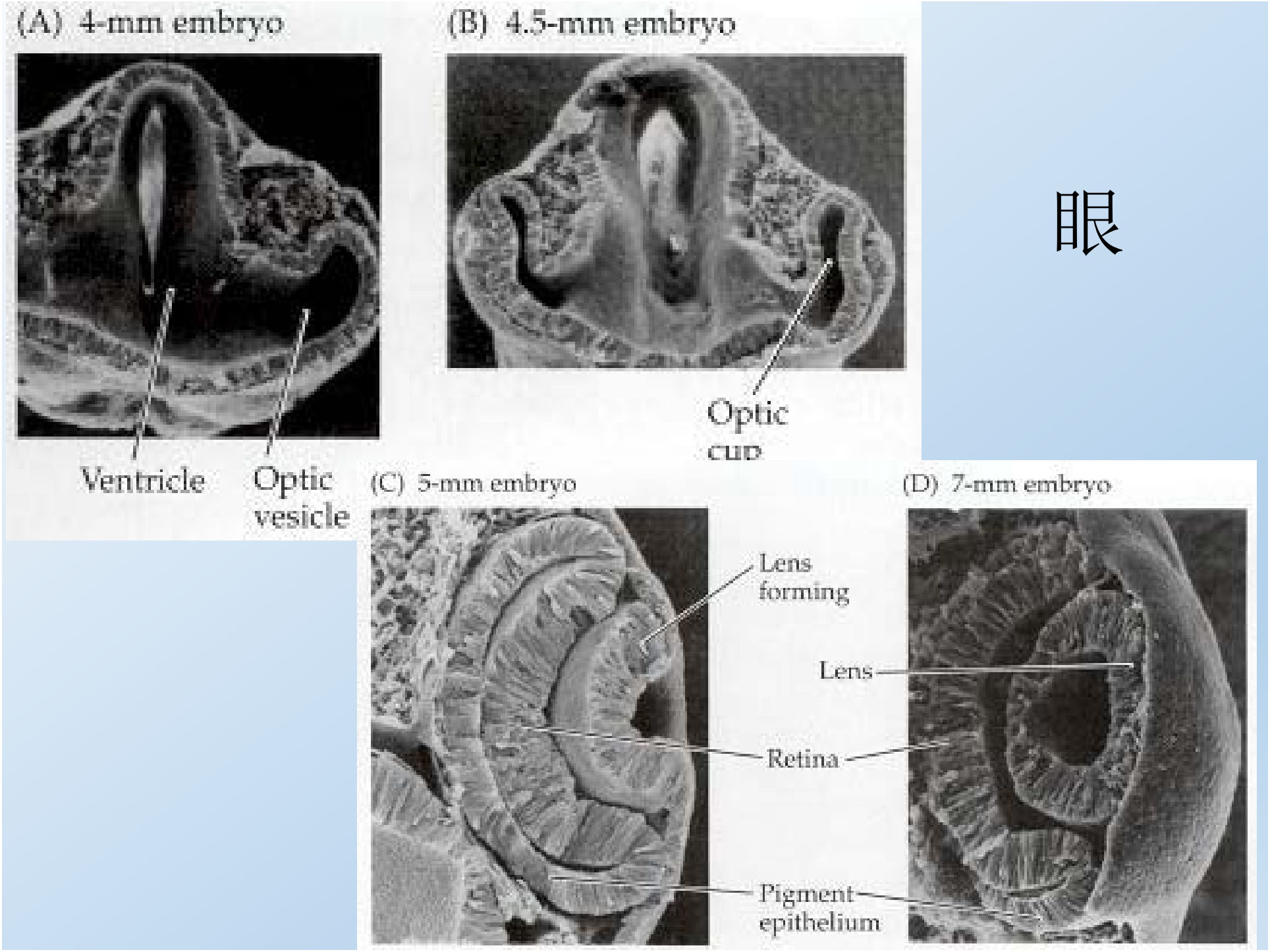


视觉的基本神经模式

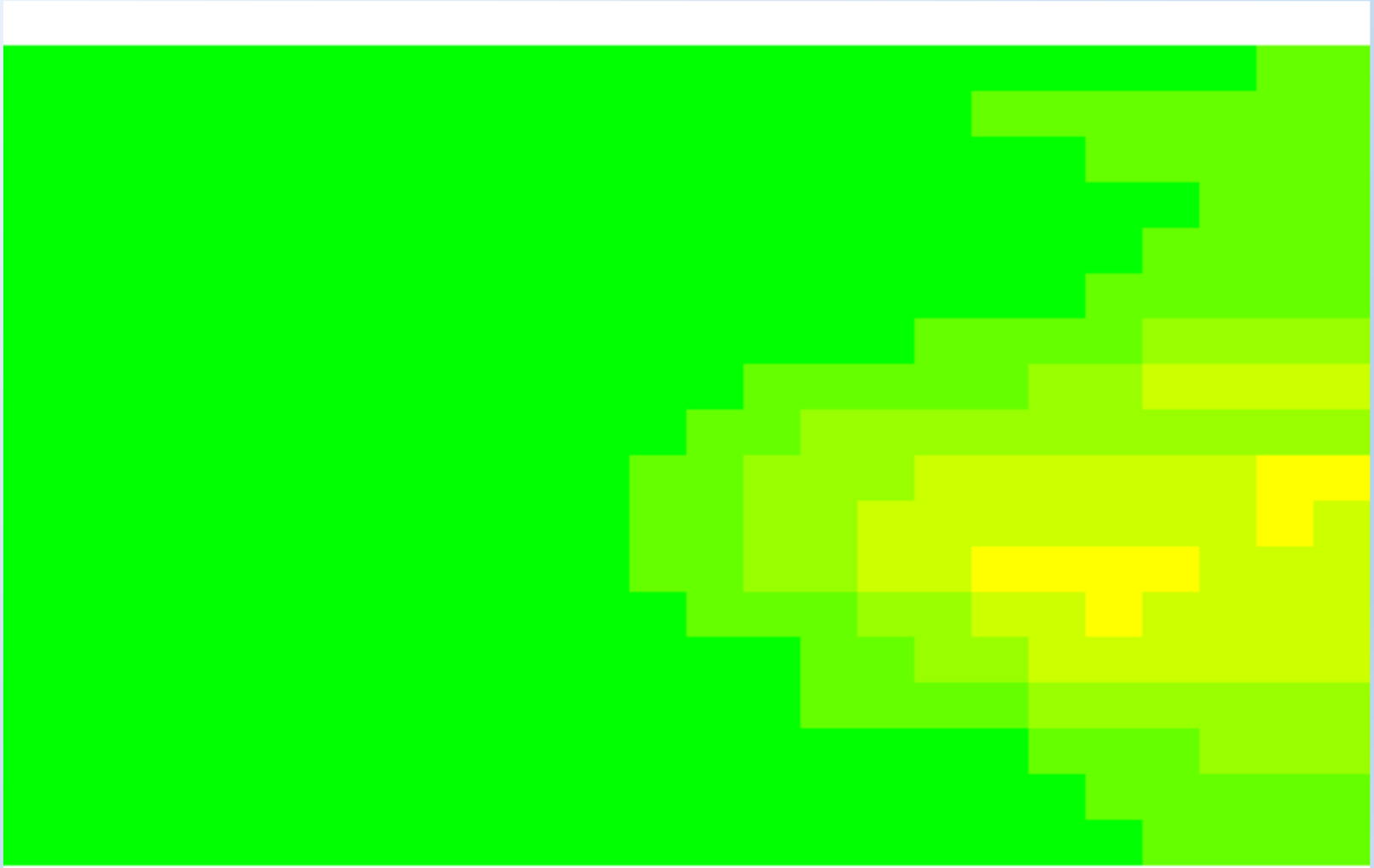


Computations in the early visual cortex, Journal of Physiology - Paris 97 (2003) 121–139

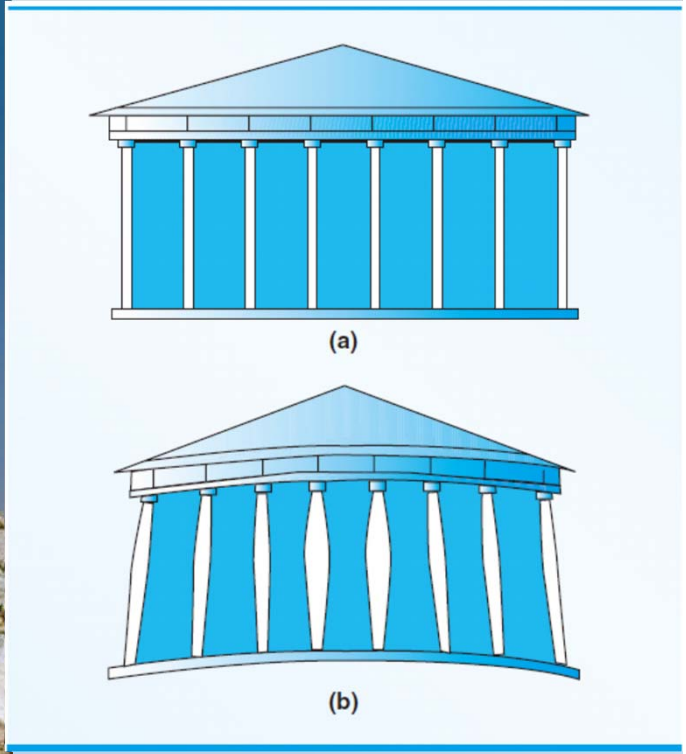
眼


(A) 4-mm embryo
(B) 4.5-mm embryo
Optic cup
Ventricle
Optic vesicle
(C) 5-mm embryo
(D) 7-mm embryo
Lens forming
Lens
Retina
Pigment epithelium

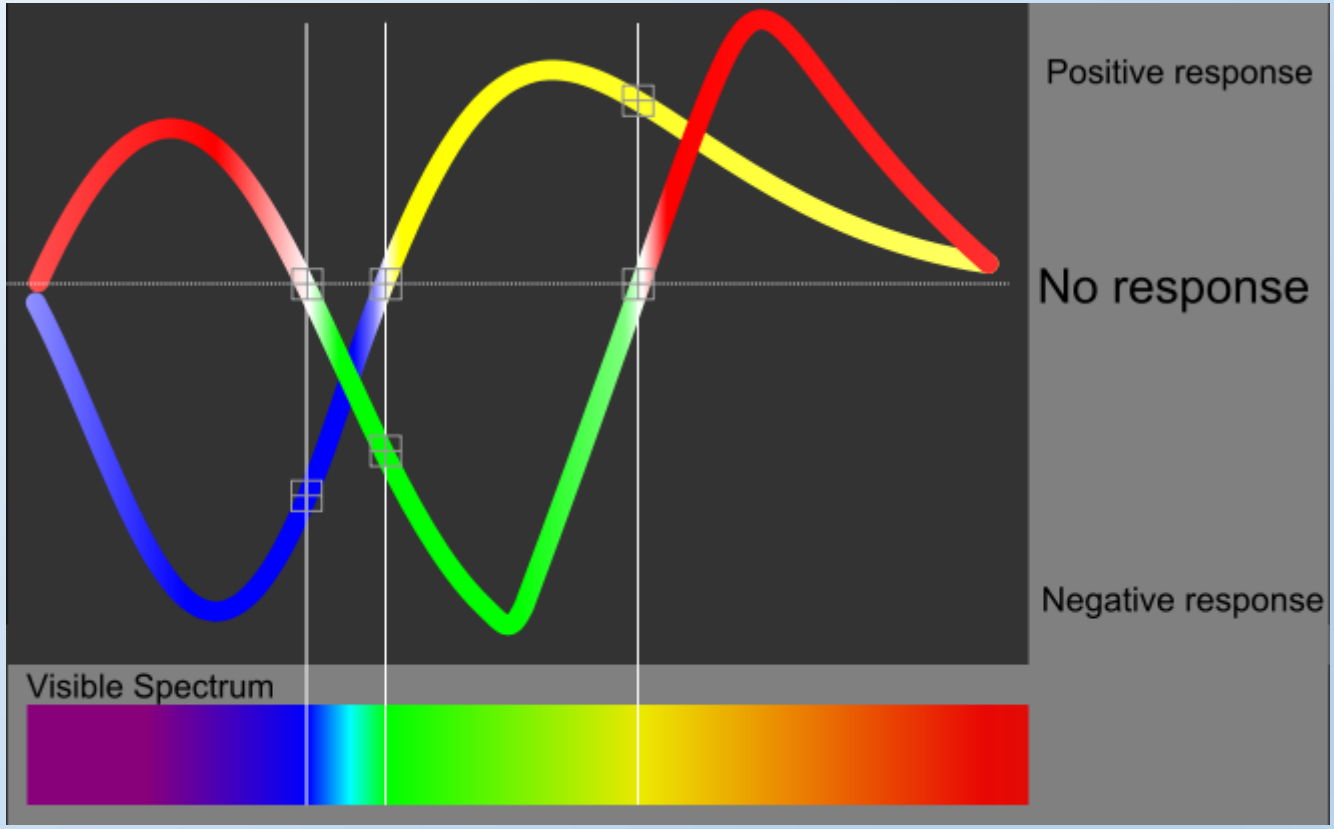
实验，盲点

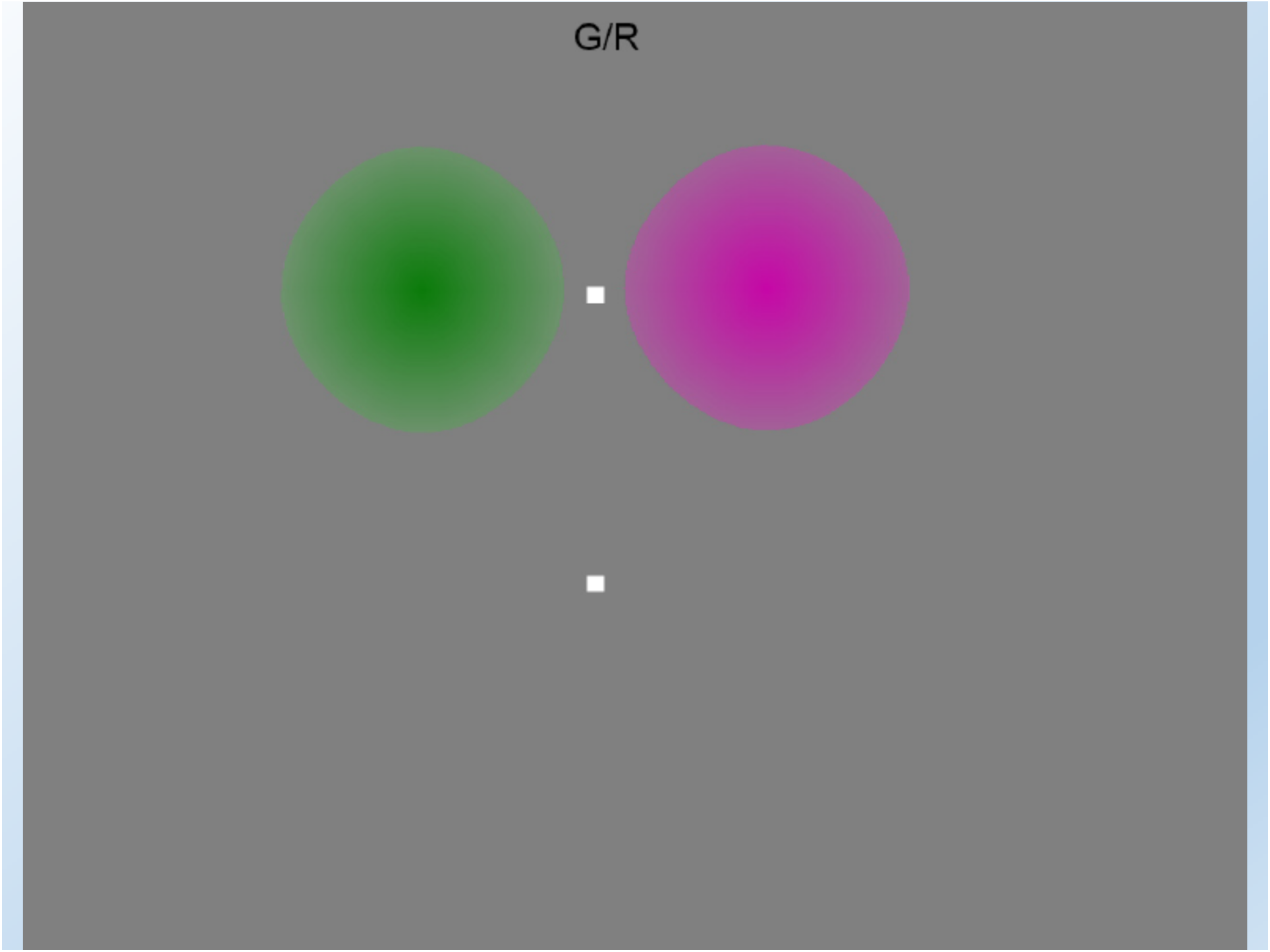


The Parthenon

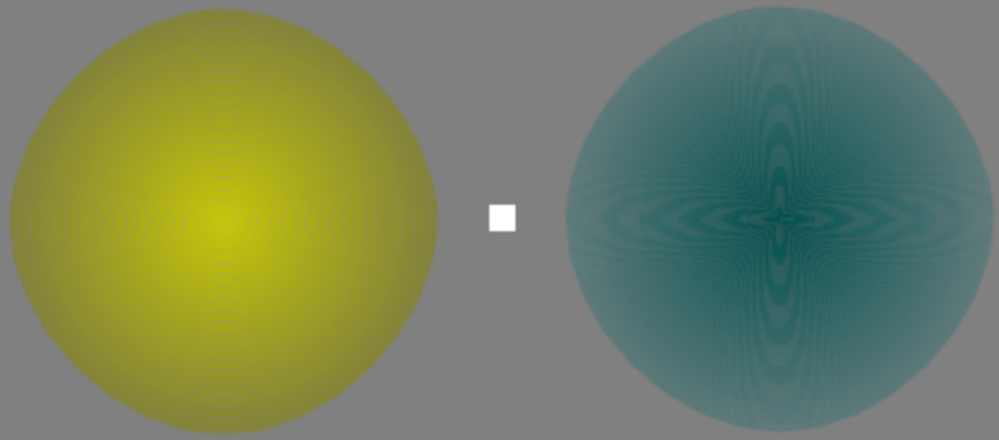


视觉颜色系统

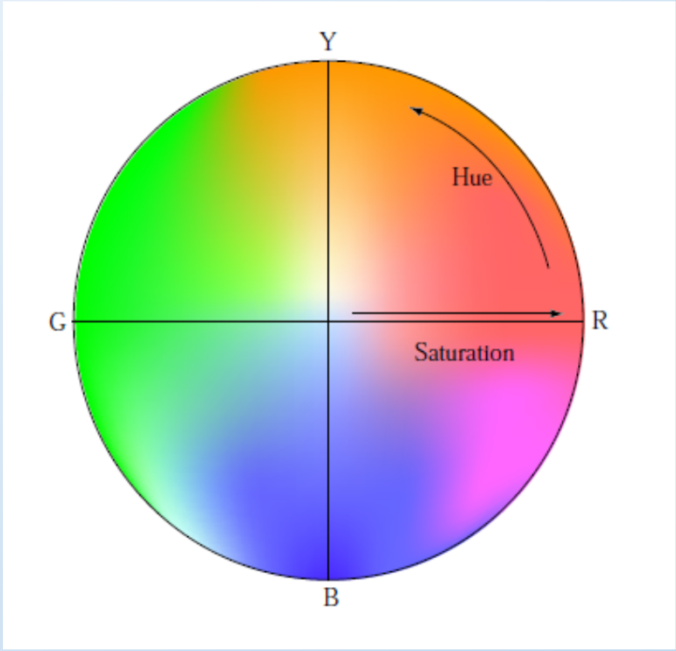

Positive response
No response
Negative response
Visible Spectrum

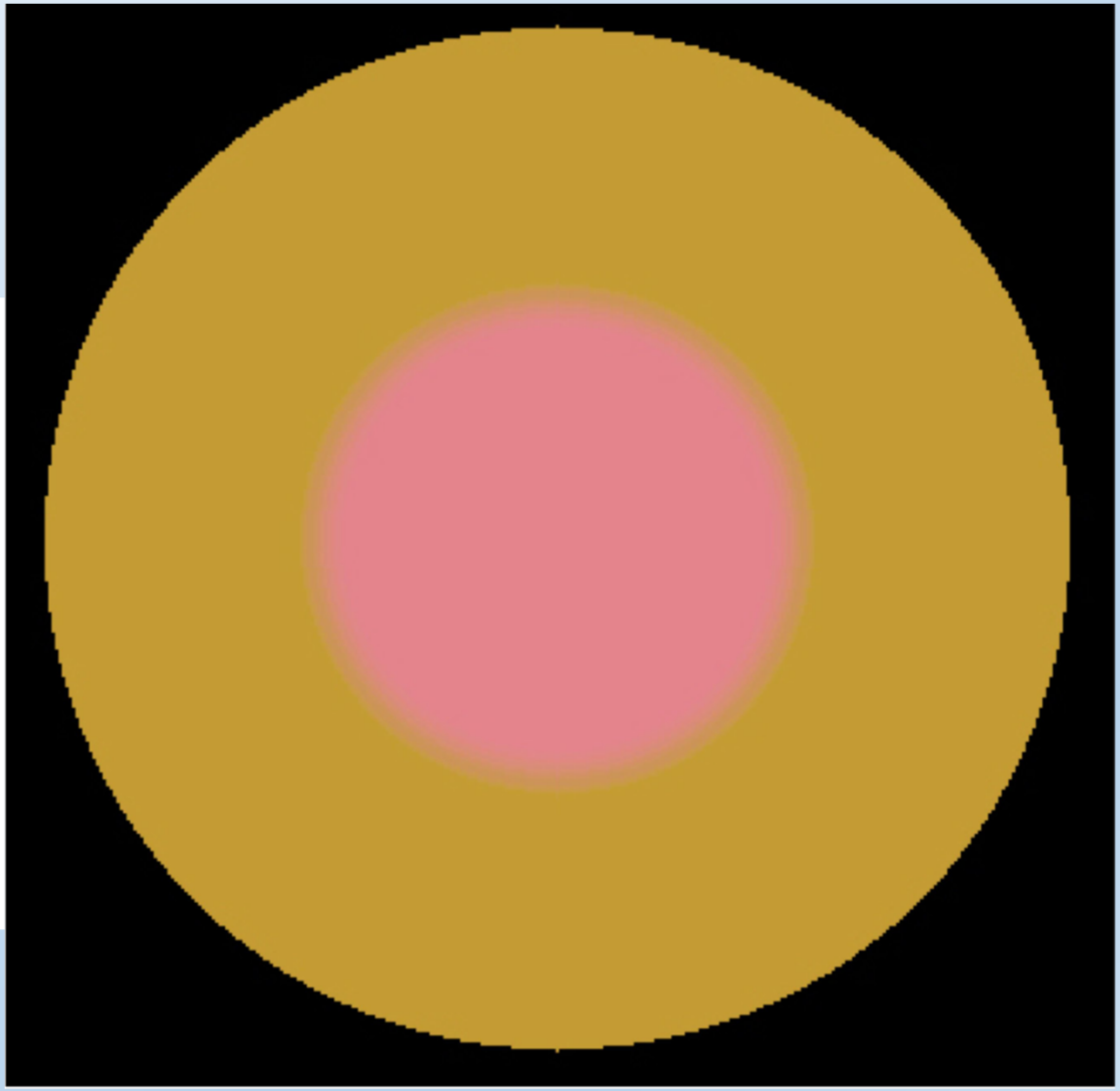

G/R

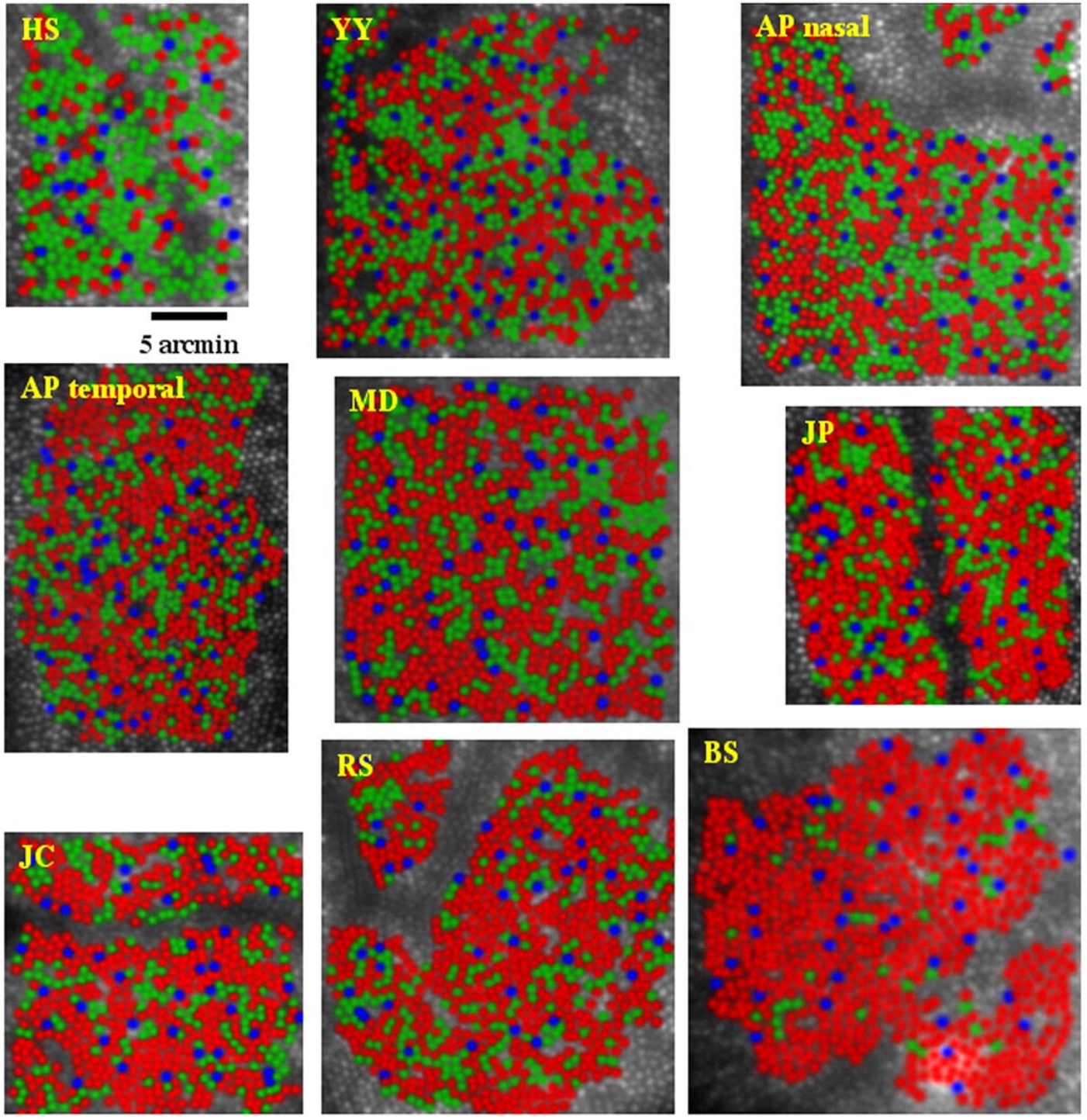
off axis



颜色与颜色竞争

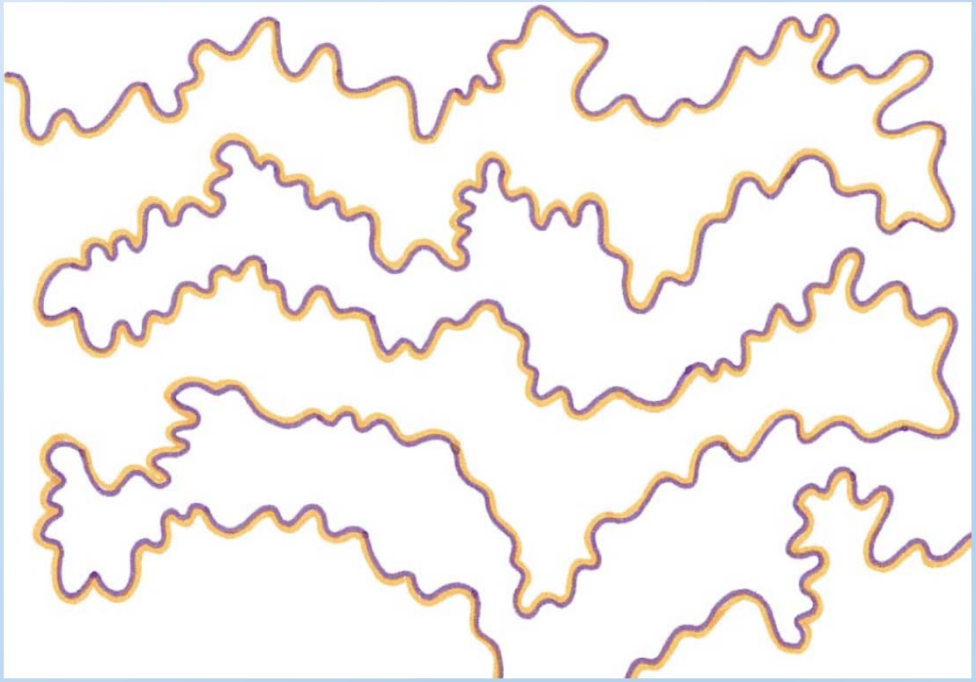




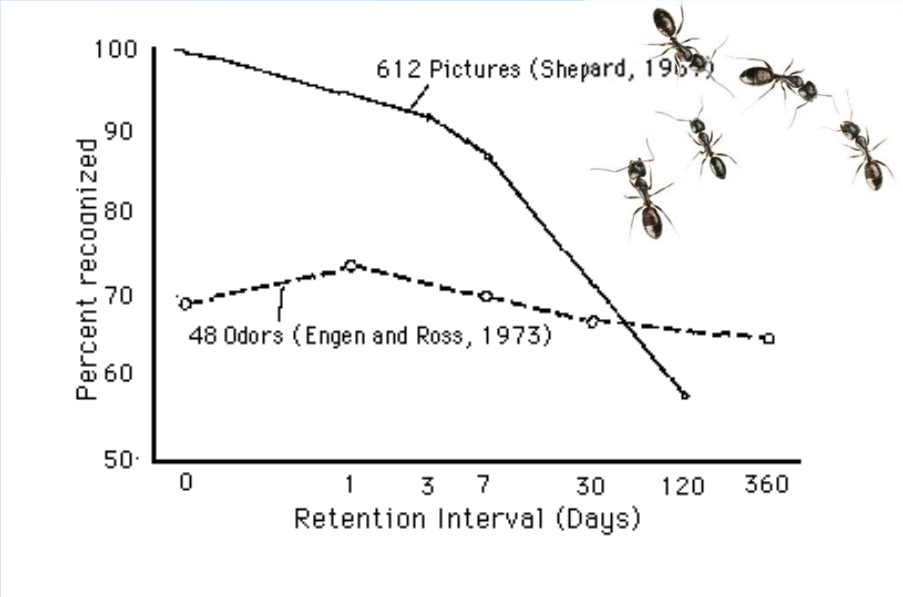


Organization of the Human Trichromatic Cone Mosaic Journal of Neuroscience 2005, 25 (42) 9669-9679

送到大脑的信息大概是这个样子



视觉的种类

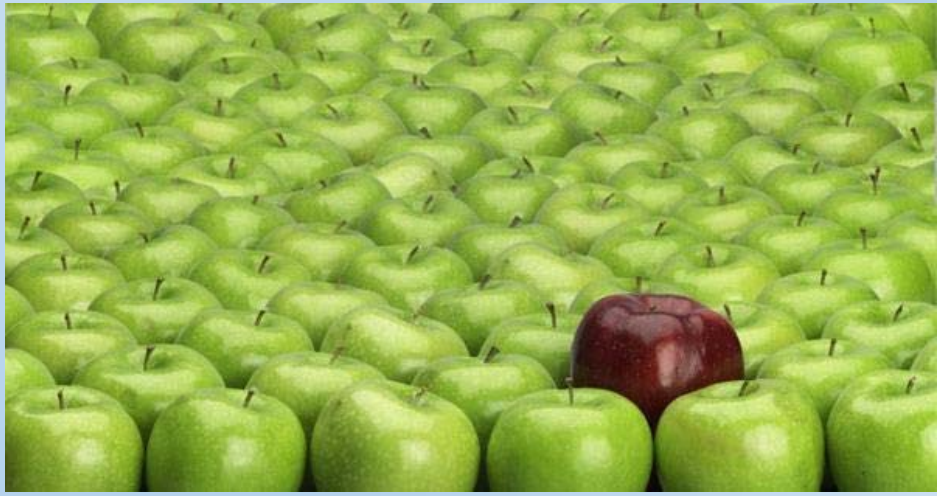


- Shepard (1967)
  - 图片比文字要高效
  - 文字:
    - 立刻: 图片 (~ 100%) 文字(88%)
    - 一周之后: 图片仍有87%!

- Standing (1973)
  - 五周之内，记忆10000张图片
  - 立刻: ~6600 张
    - 一年以后 90仍然记得

视觉的主要挑战

- 高精度与高速度的平衡
- 维持物体的恒常性
- 视觉是一个自治系统



The Unexpected Visitor by Repin


1


2


3


4

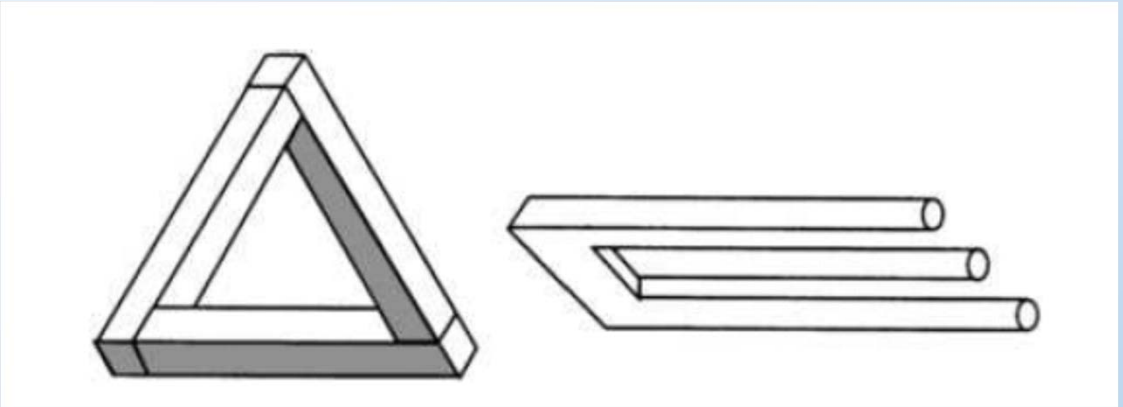

5


6

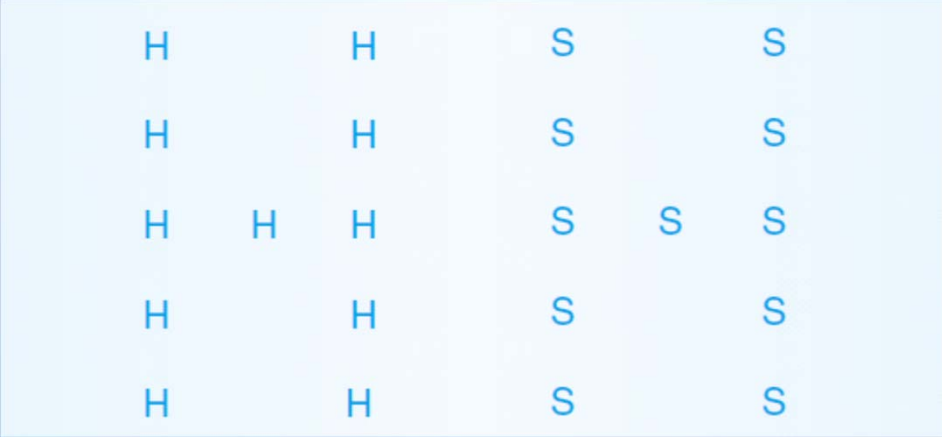

7

特点

- 注视
- 关系

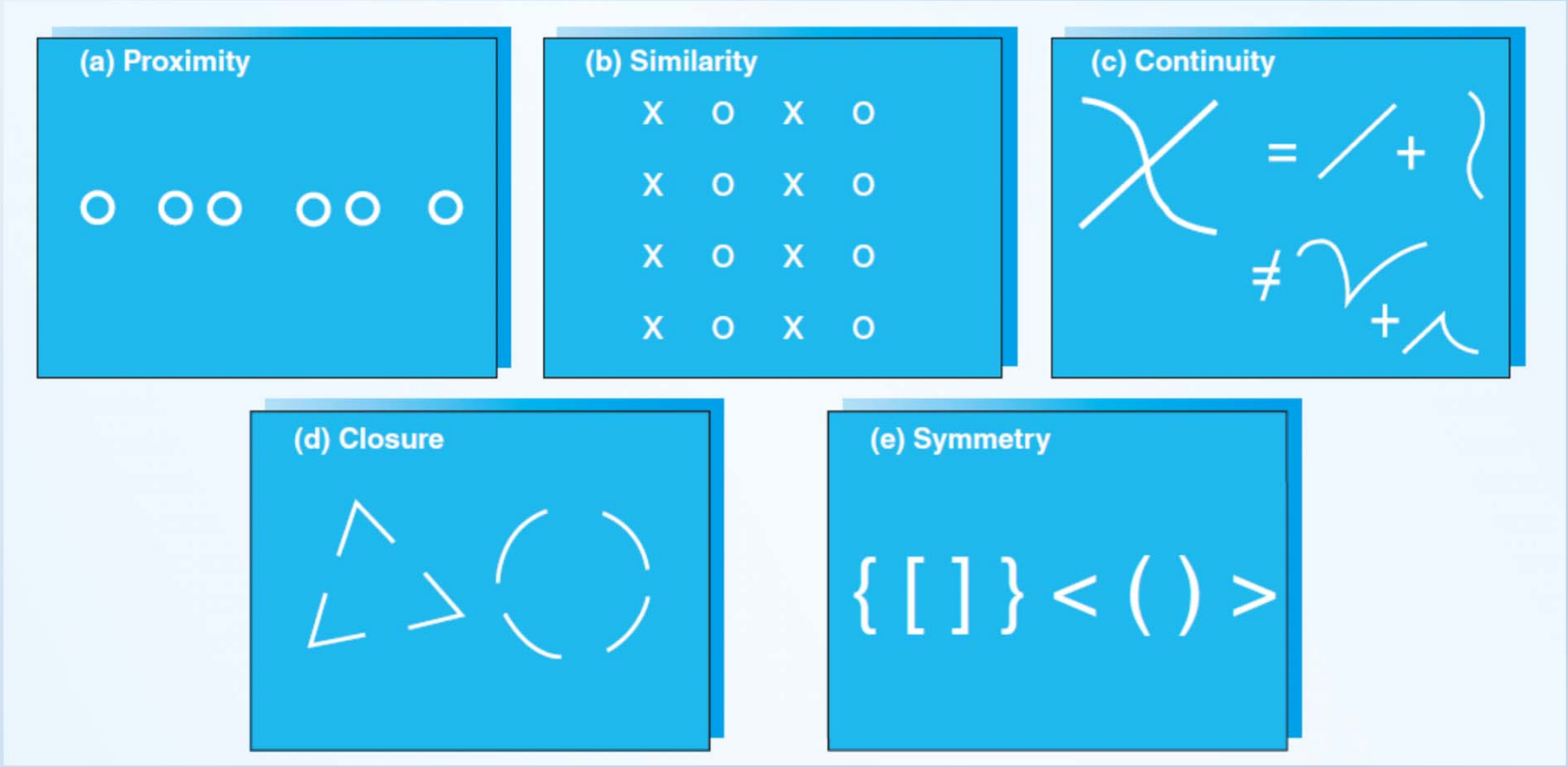



H H S S
H H S S
H H S S
H H S S
H H H H H H S S S S S S
H H S S
H H S S
H H S S
H H S S

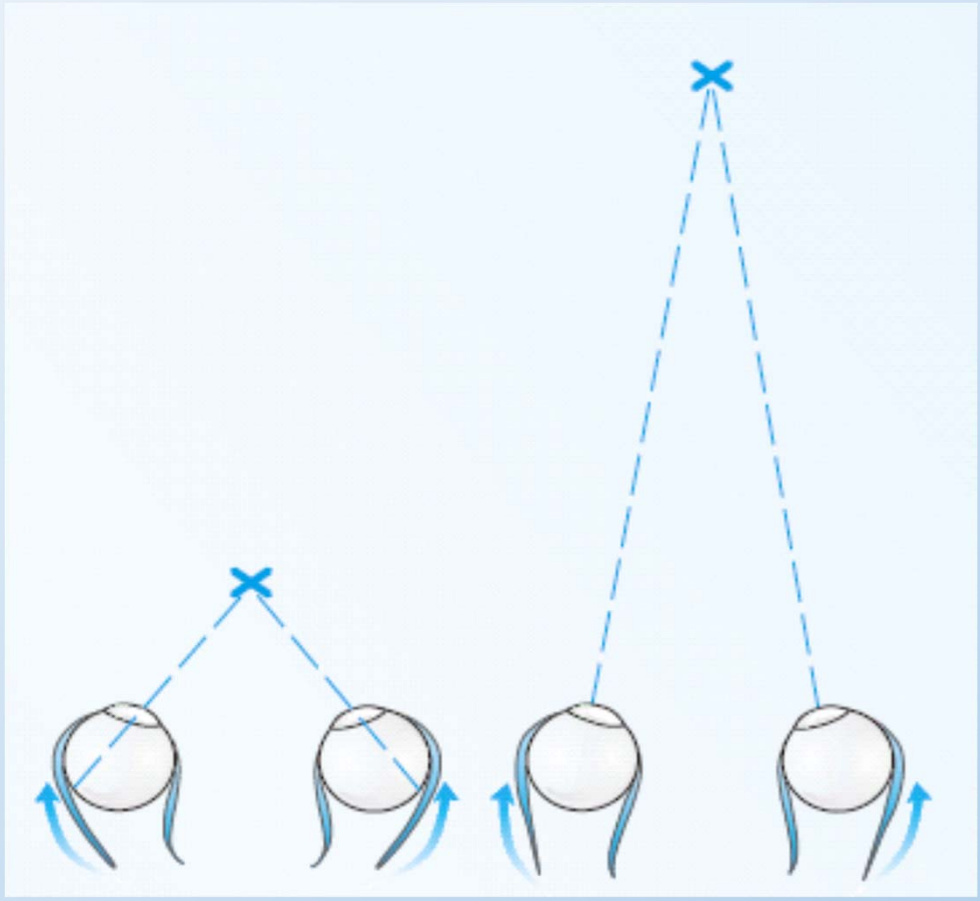

H H S S
H H S S
H H H S S S
H H S S
H H S S

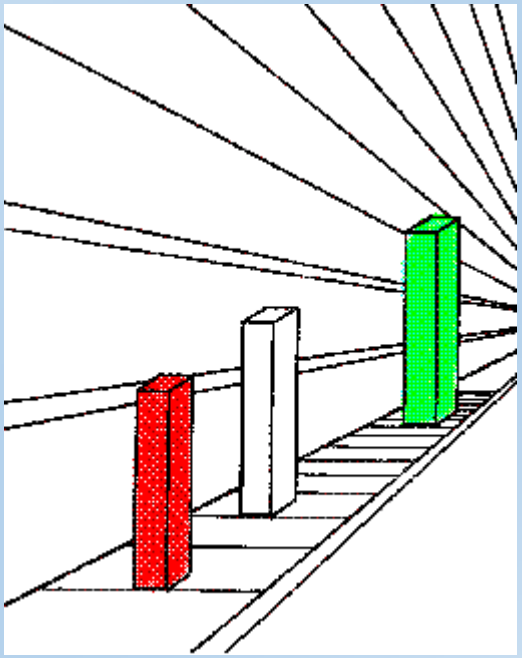
视觉有强烈的组合倾向

几个要素

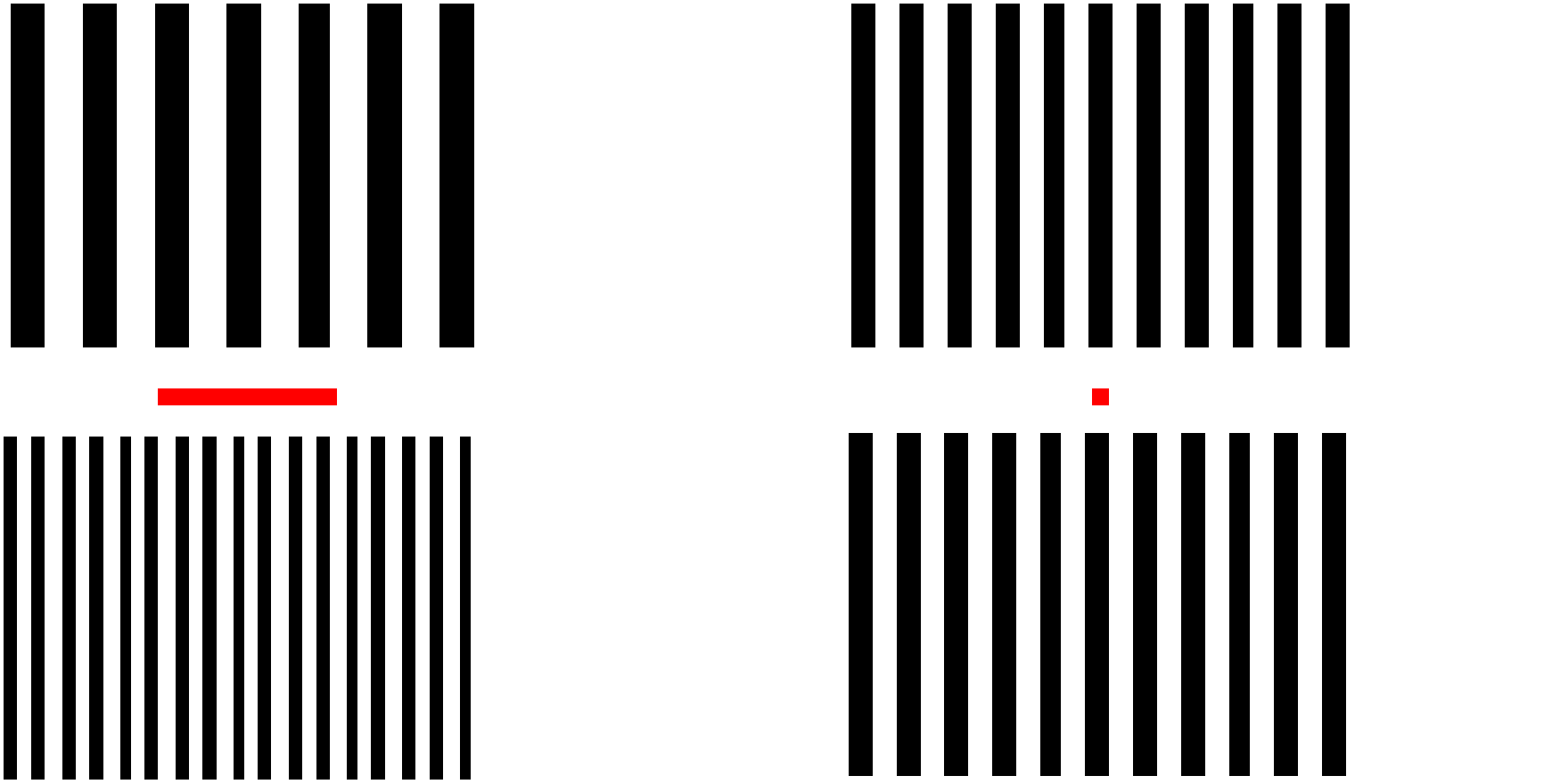

(a) Proximity
(b) Similarity
x o x o
x o x o
x o x o
x o x o
(c) Continuity
=
+
≠
+
(d) Closure
(e) Symmetry
{ [ ] } < ( ) >

距离知觉，大小知觉





距离知觉，大小知觉



Adapted from Blakemore & Sutton, 1969

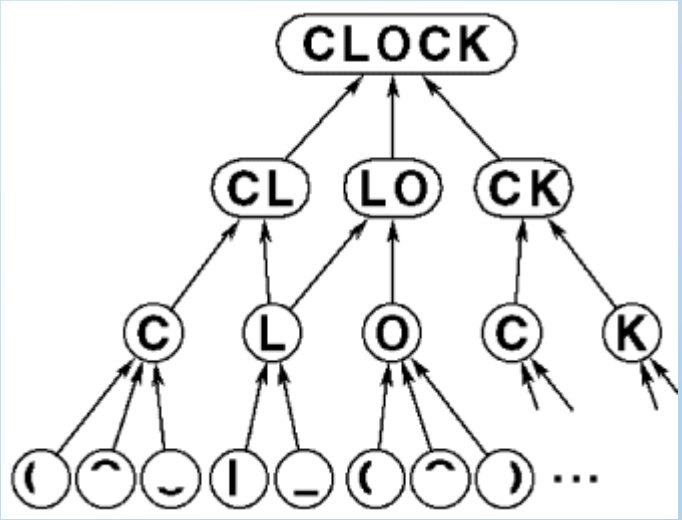
从视网膜影像，到意识中的形状

我们感知到的世界，与我们看到的是不一样的

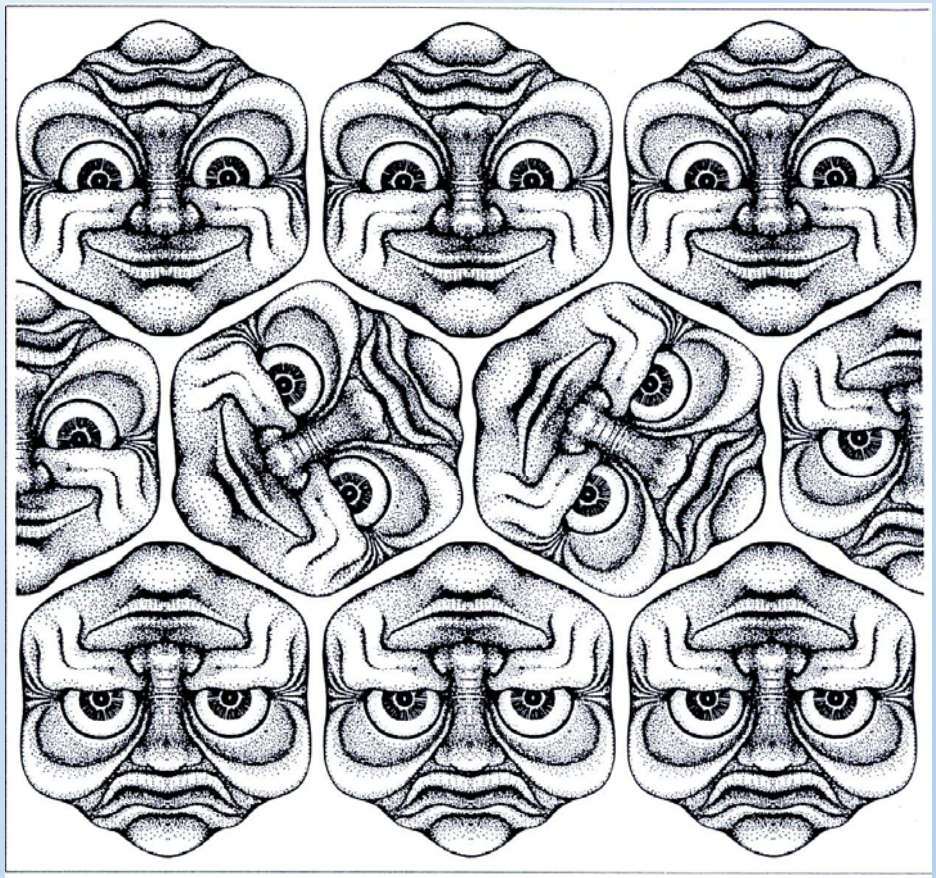
反射还是真实

视觉知觉

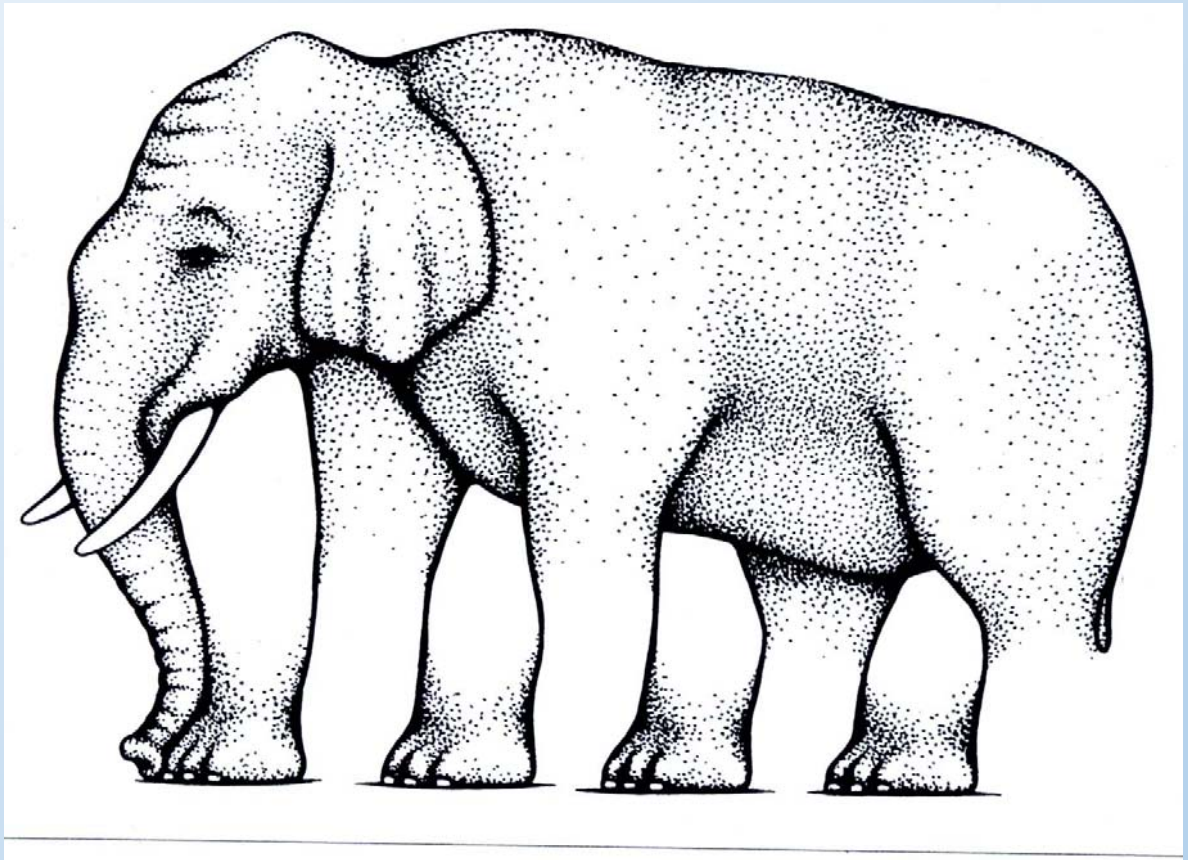
- 基于模式的
- 基于细节的



基于模式的

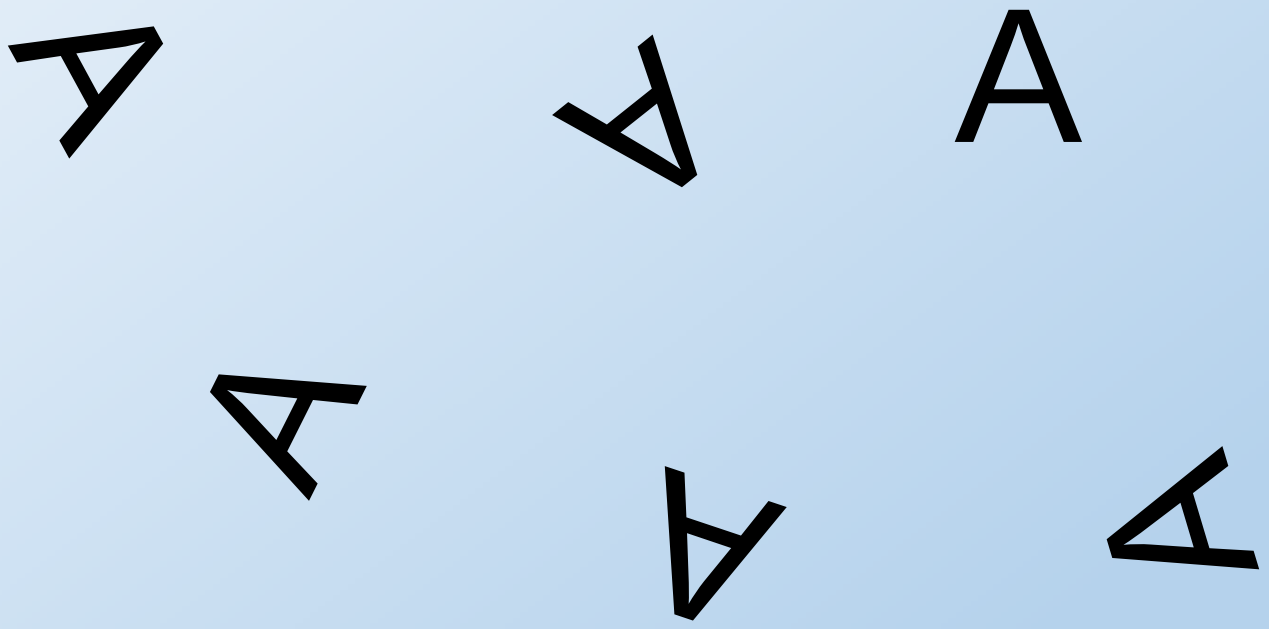


C1 GLEE TURNS GLUM



E1 L'EGS-ISTENTIAL QUANDARY

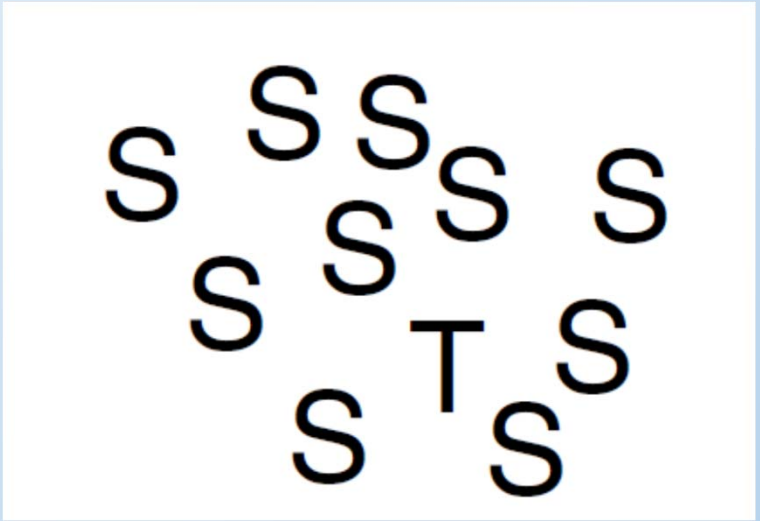
模式匹配理论

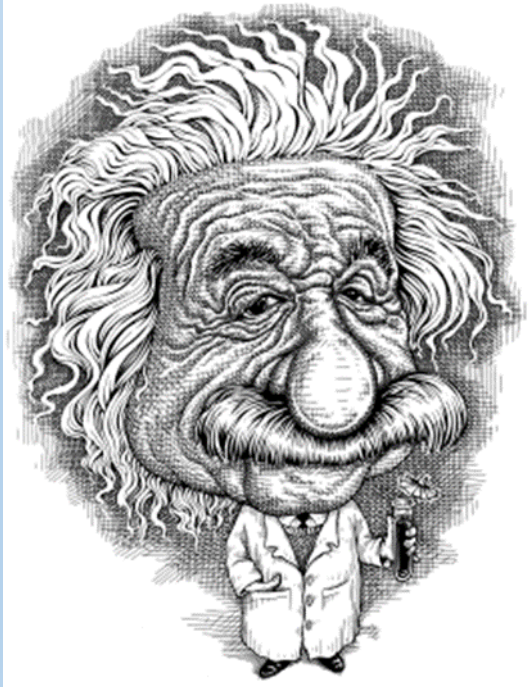


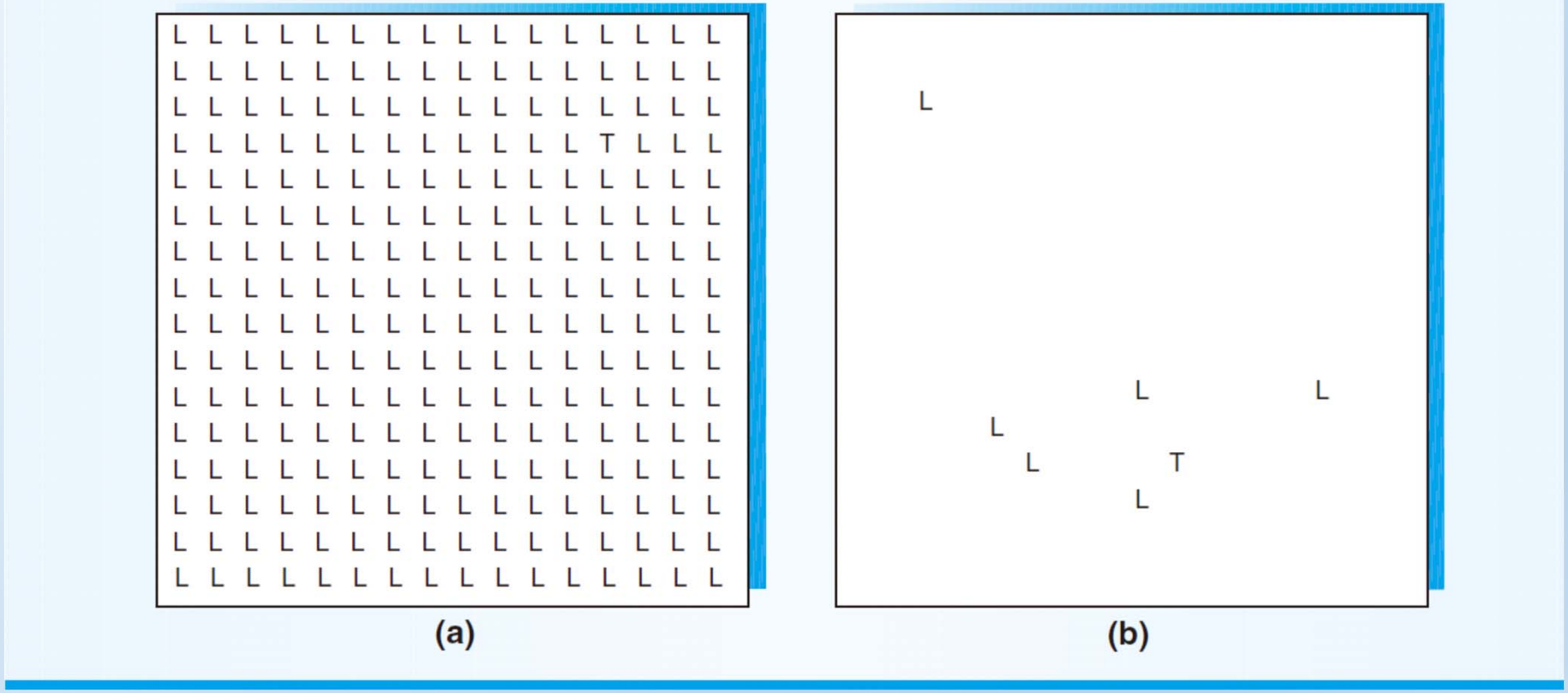

Aa Aa Aa Aa Aa Aa
Aa Aa Aa Aa Aa Aa
Aa Aa Aa Aa Aa Aa
Aa Aa Aa Aa Aa Aa
Aa Aa .....

识别错误

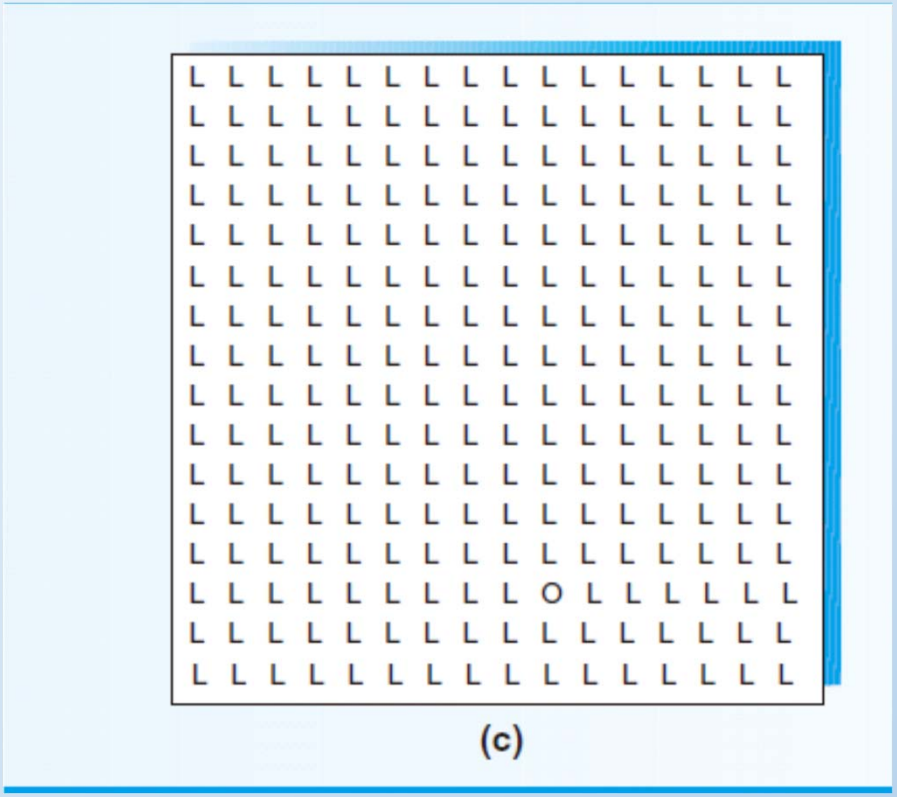
- 为什么会错误
- 为什么会有不同的速度






(a)
(b)

找O


L L L L L L L L L L L L L L L
L L L L L L L L L L L L L L L
L L L L L L L L L L L L L L L
L L L L L L L L L L L L L L L
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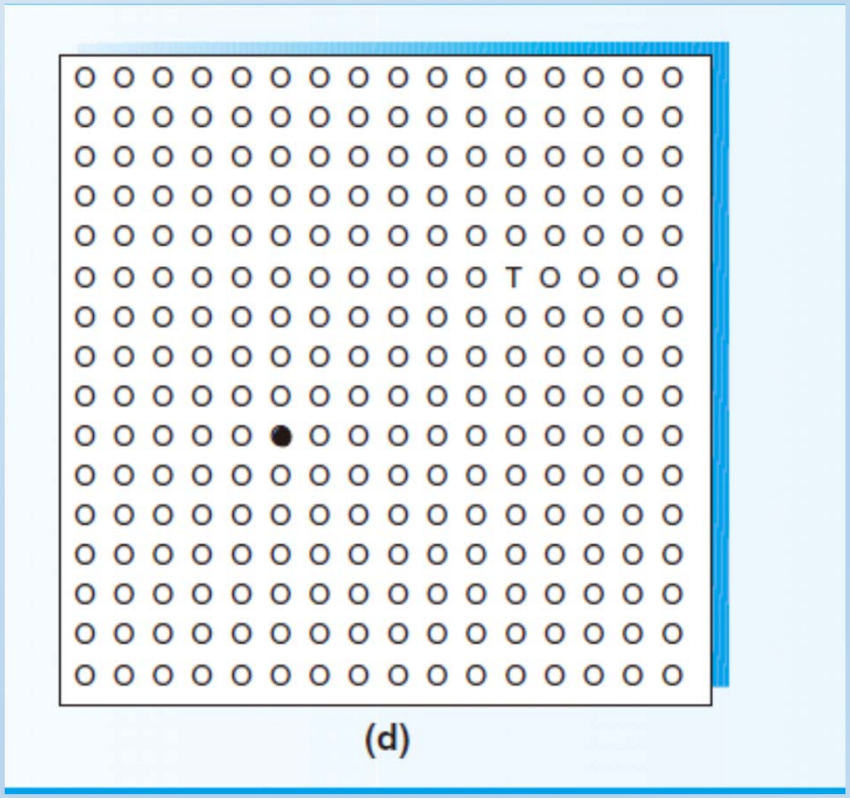
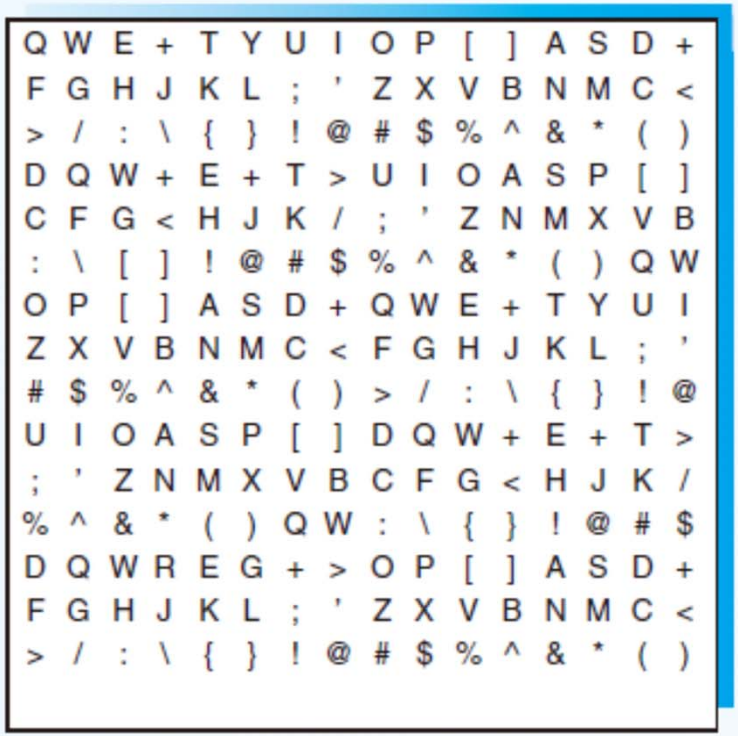
L L L L L L L L L O L L L L L
L L L L L L L L L L L L L L L
L L L L L L L L L L L L L L L

(c)

找T



找大写的 R



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F G H J K L ; ' Z X V B N M C <
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O P [ ] A S D + Q W E + T Y U I
Z X V B N M C < F G H J K L ; '
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F G H J K L ; ' Z X V B N M C <
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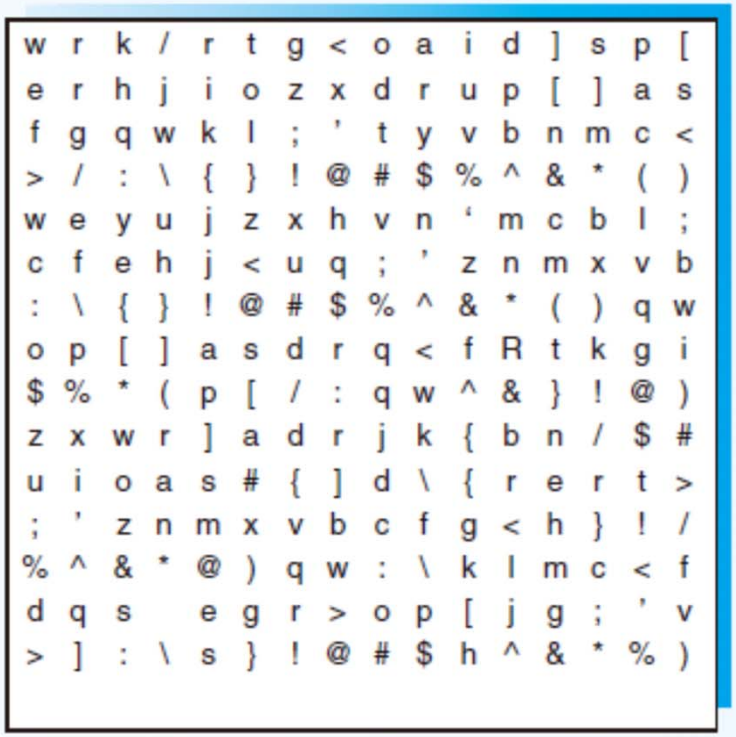
(f)



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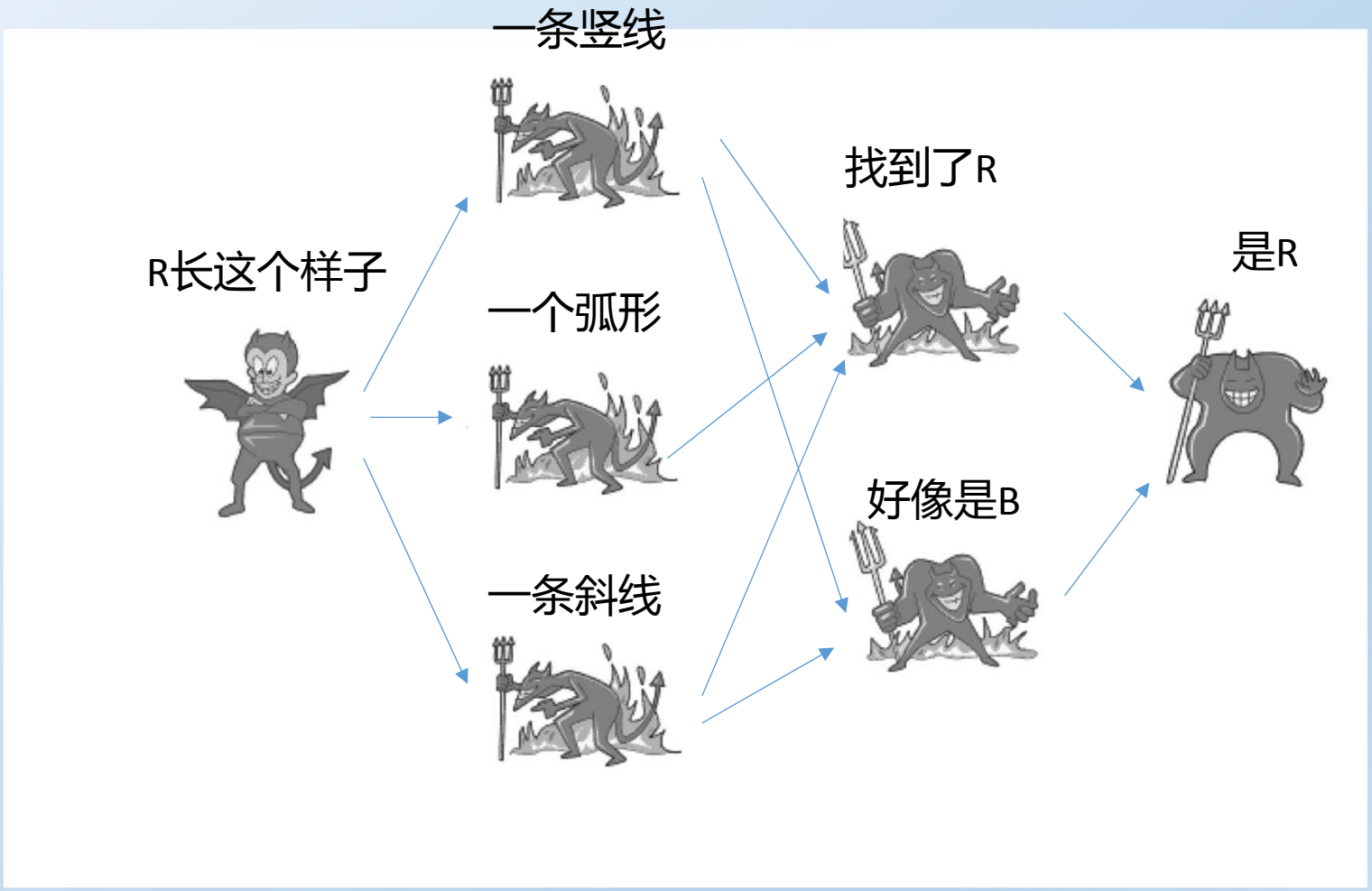
(g)

基于细节的



识别个体与识别类别








多个层次的分类

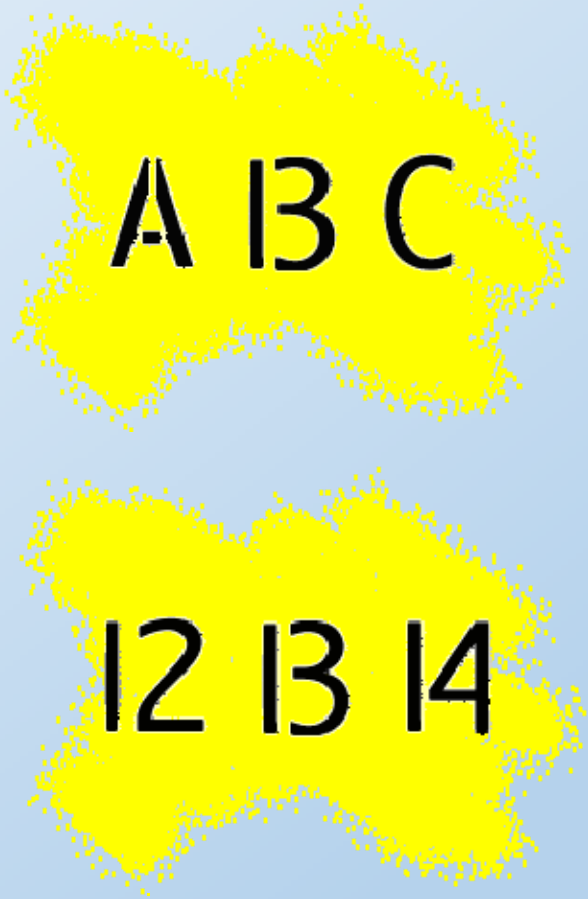
家具

椅子

沙发

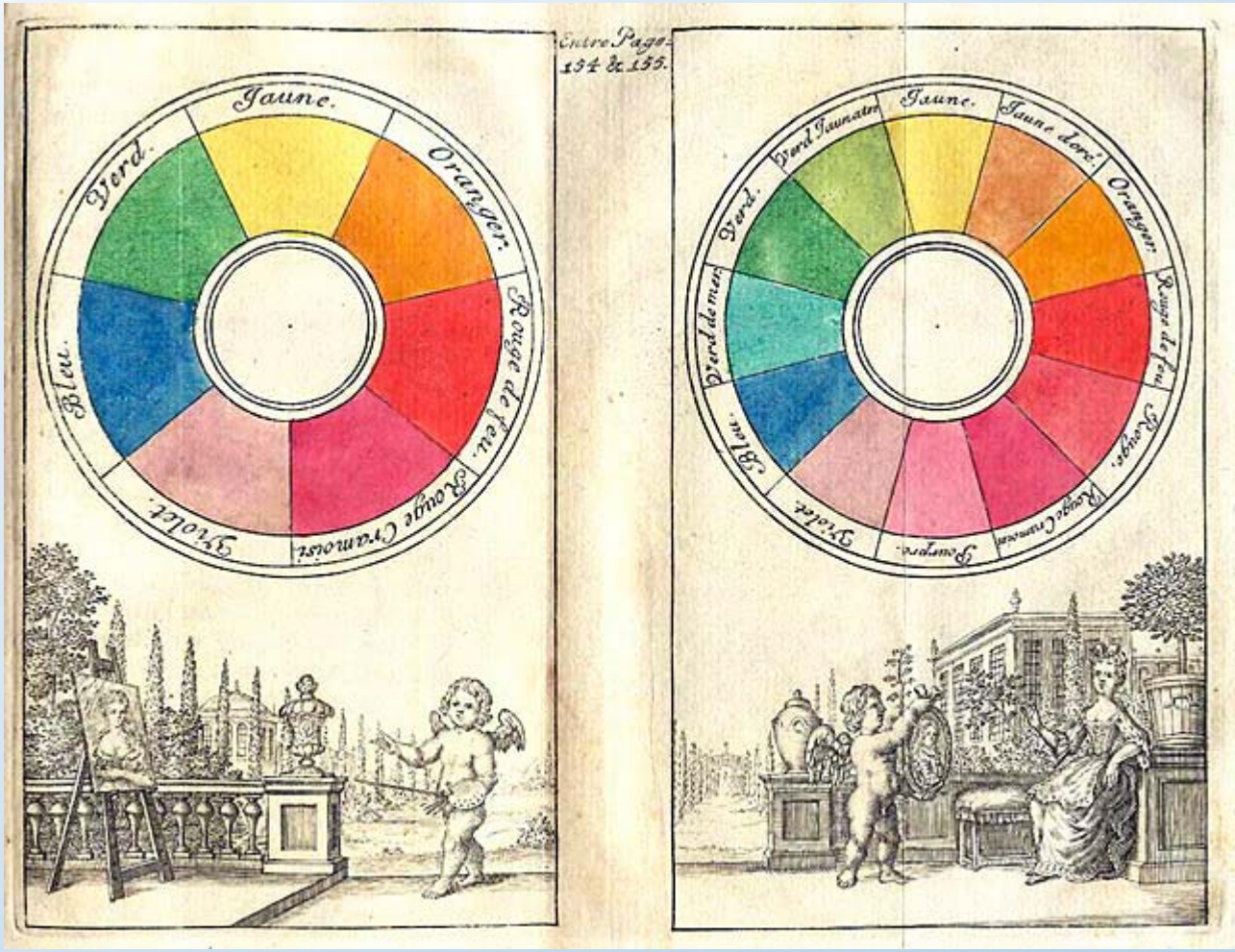
基于特征的识别的缺点

仅仅细节不足以决定意义



视觉的层次

- 针对个体信息的
- 针对整体信息的
- 针对类别信息的


Entre Page-
134 & 135.
Jaune.
Orangez.
Rouge de feu.
Rouge Cramoisi.
Violet.
Bleu.
Verd.
Jaune.
Jaune doré.
Orangez.
Rouge de feu.
Rouge.
Rouge Cramoisi.
Violet.
Bleu.
Verd de mer.
Verd.
Verd Jaunatre.