

**Rozvoj lidských zdrojů TUL pro zvyšování relevance,
kvality a přístupu ke vzdělání v podmínkách Průmyslu 4.0**

Základy KOLORISTIKY

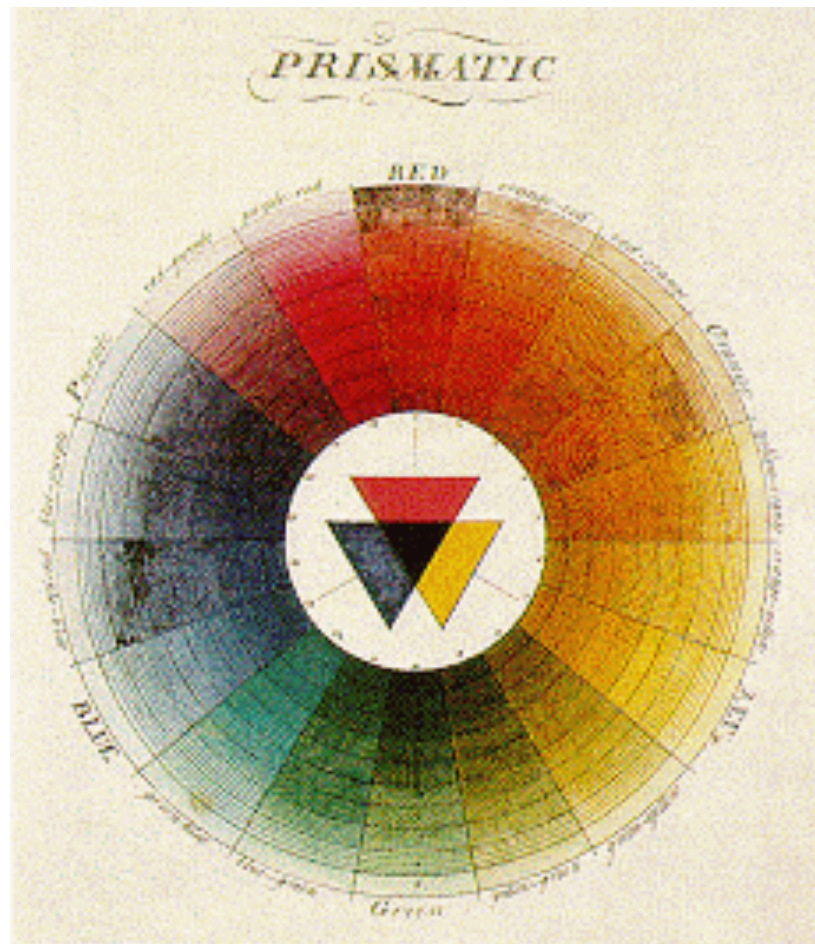
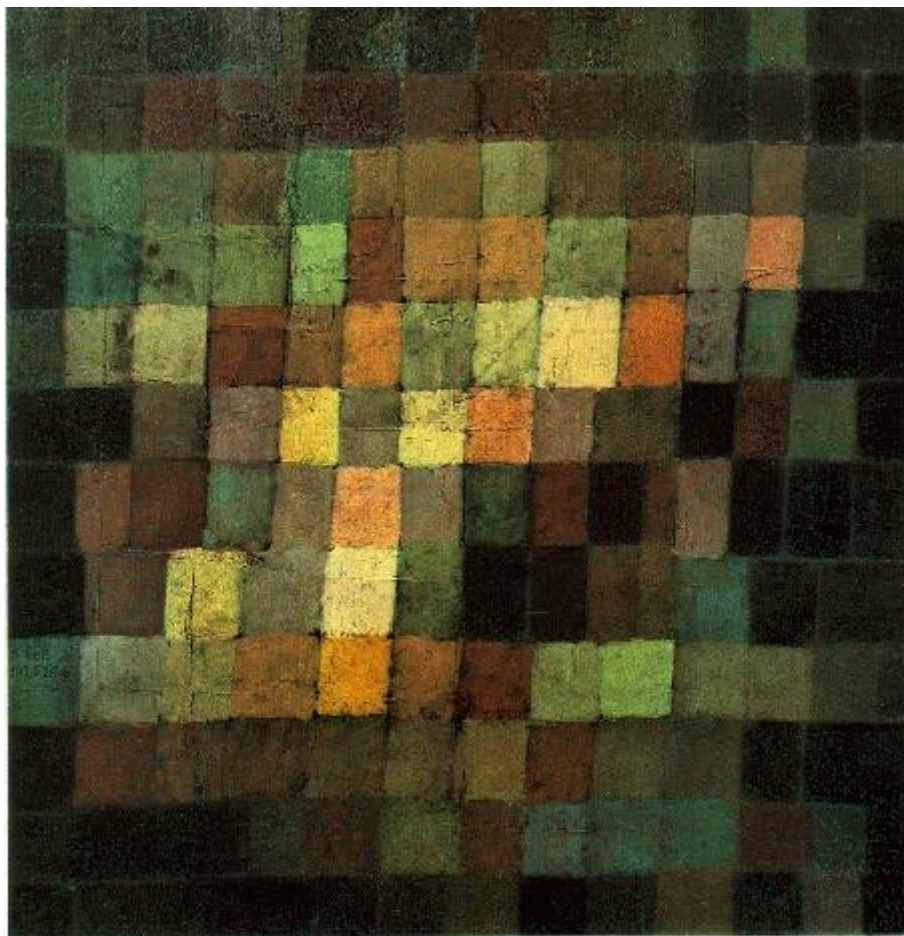
Lektor: doc. Ing. Michal Vik, Ph.D.
doc. Ing. Martina Viková, Ph.D.



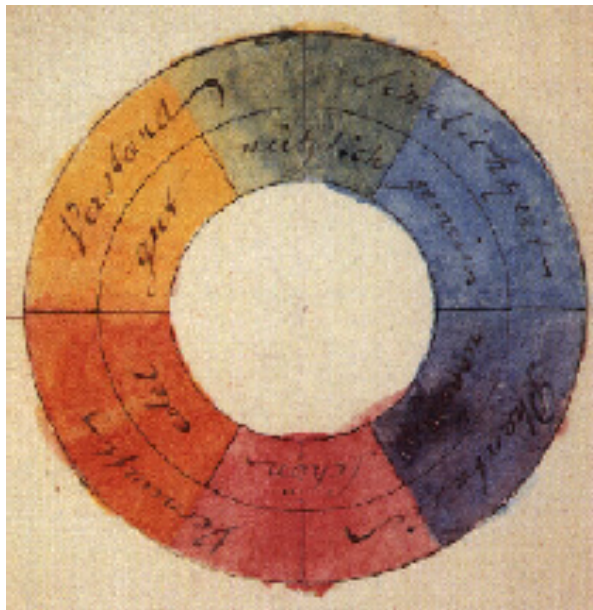
EVROPSKÁ UNIE
Evropské strukturální a investiční fondy
Operační program Výzkum, vývoj a vzdělávání


MINISTERSTVO ŠKOLSTVÍ,
MLÁDEŽE A TĚLOVÝCHOVY

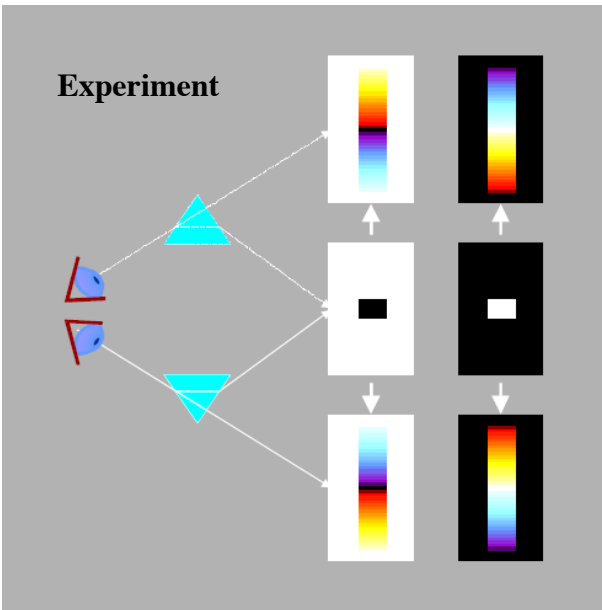
Atlasy a číselníky barev II



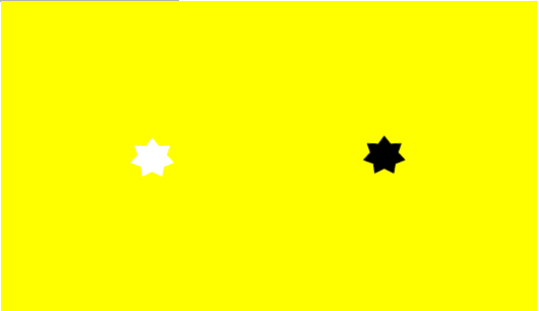
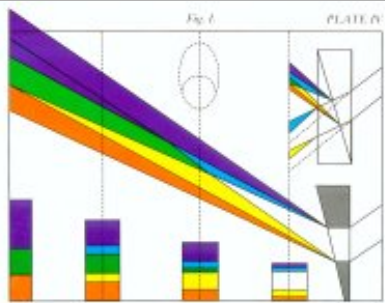
Johann Wolfgang Goethe (1749-1832) I



Oponentní model (Teorie barev, 1823)
žlutá (slunce) proti modré (tma) a
červená proti zelené

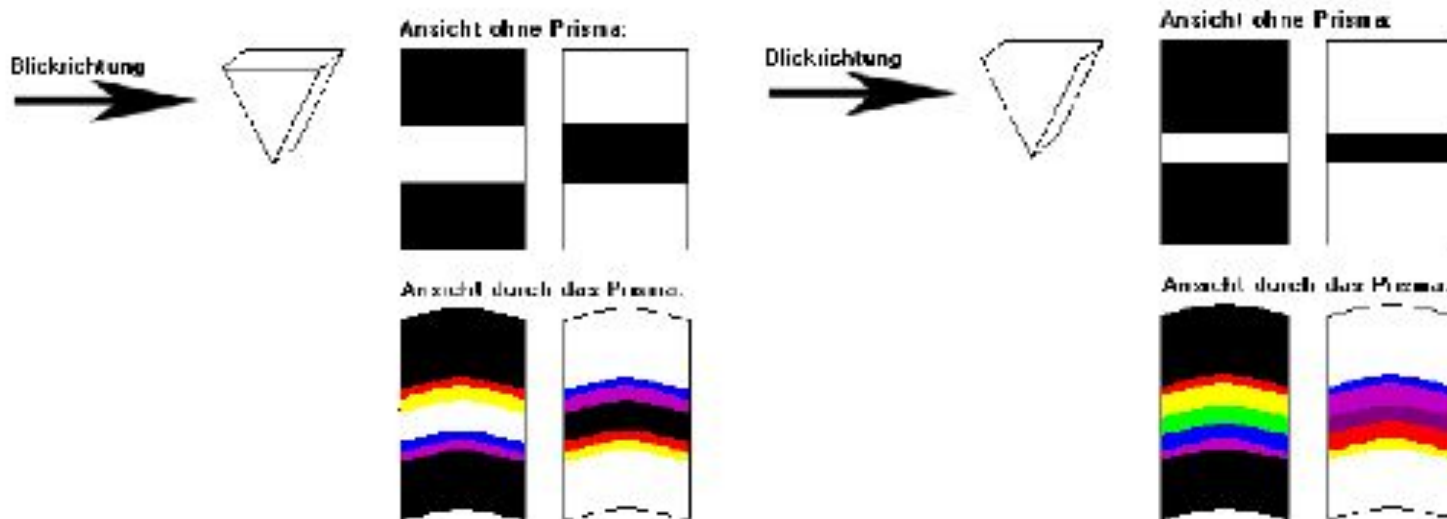


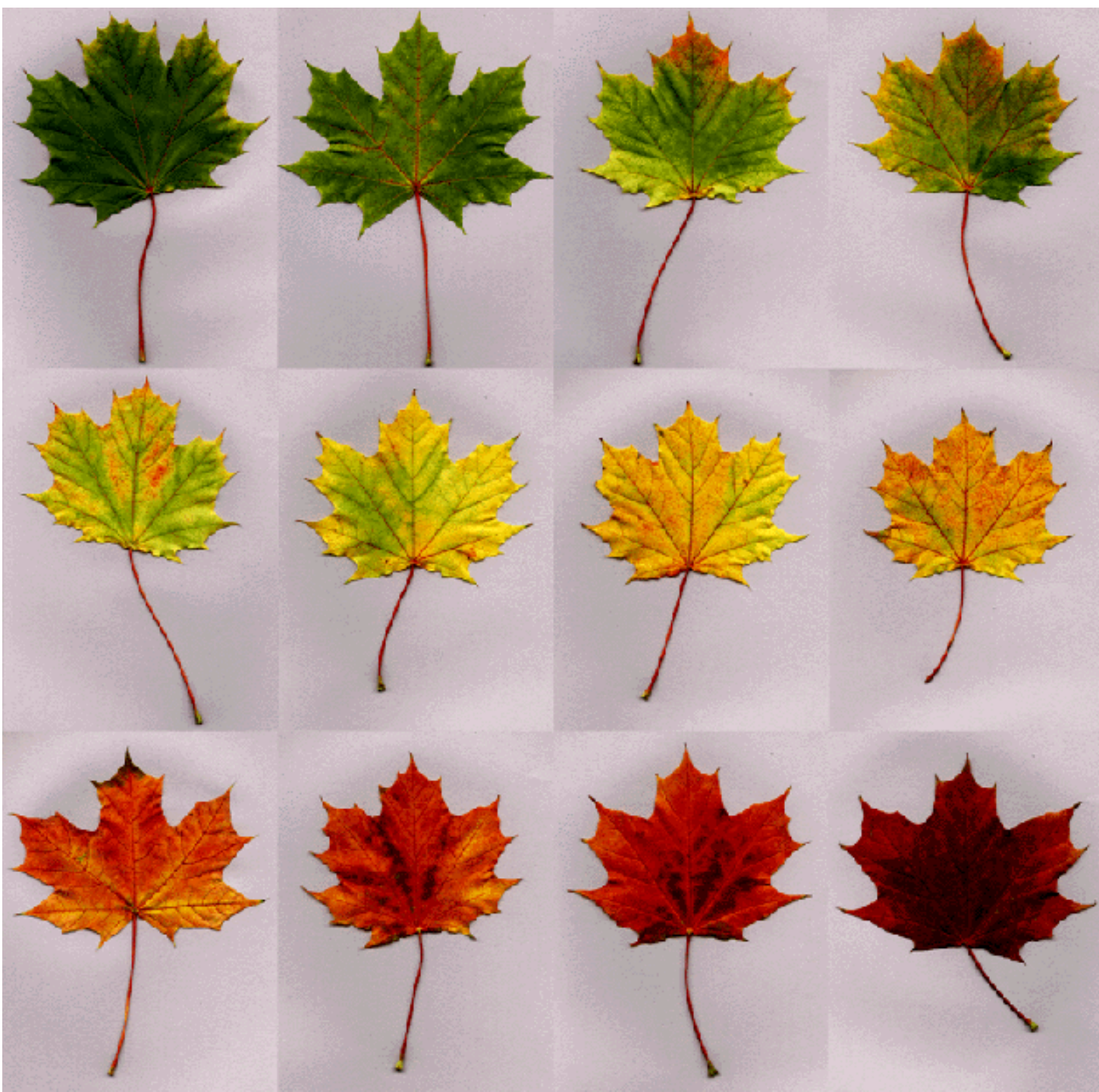
(1749-1832)

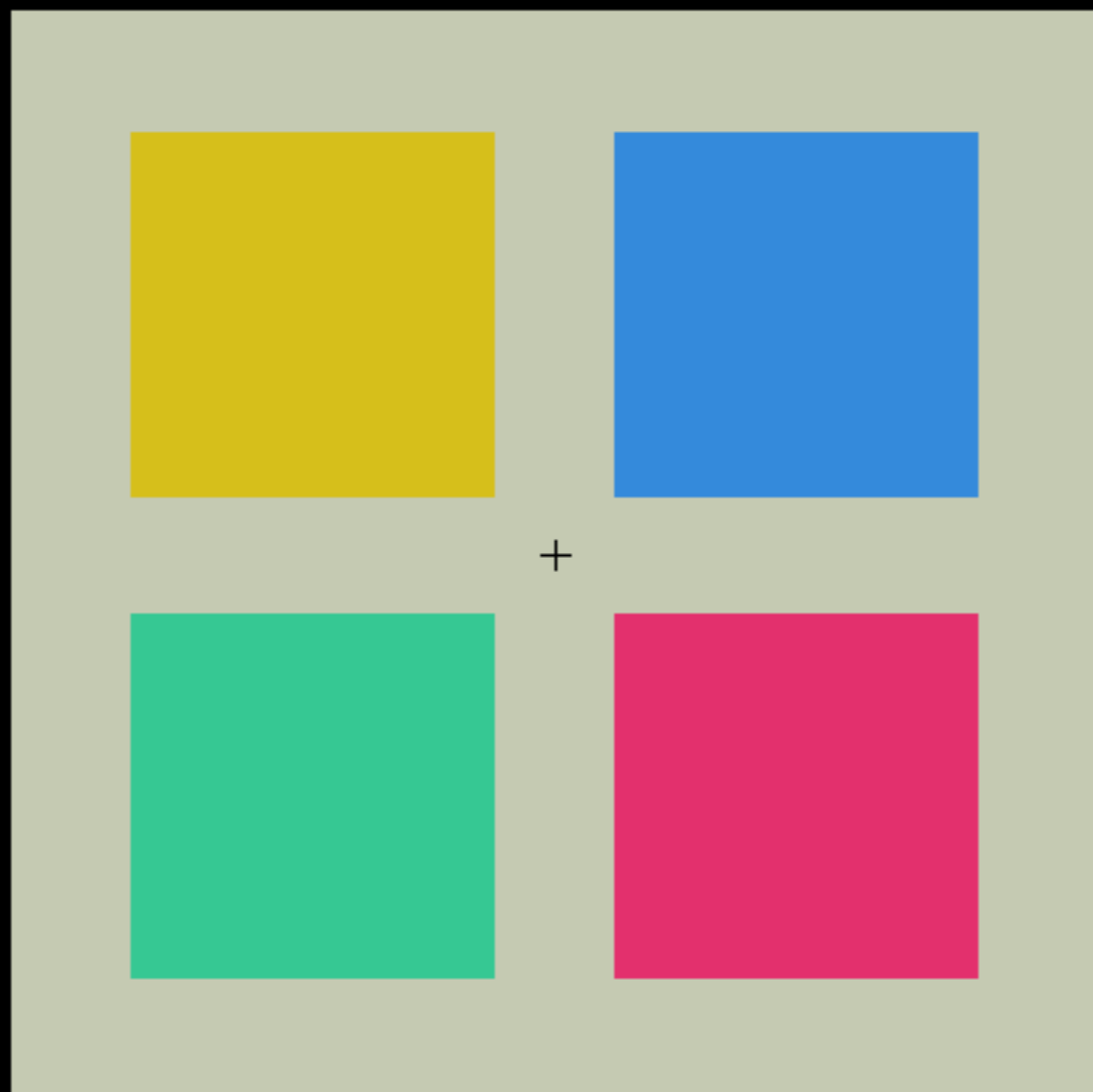


Johann Wolfgang Goethe (1749-1832) II

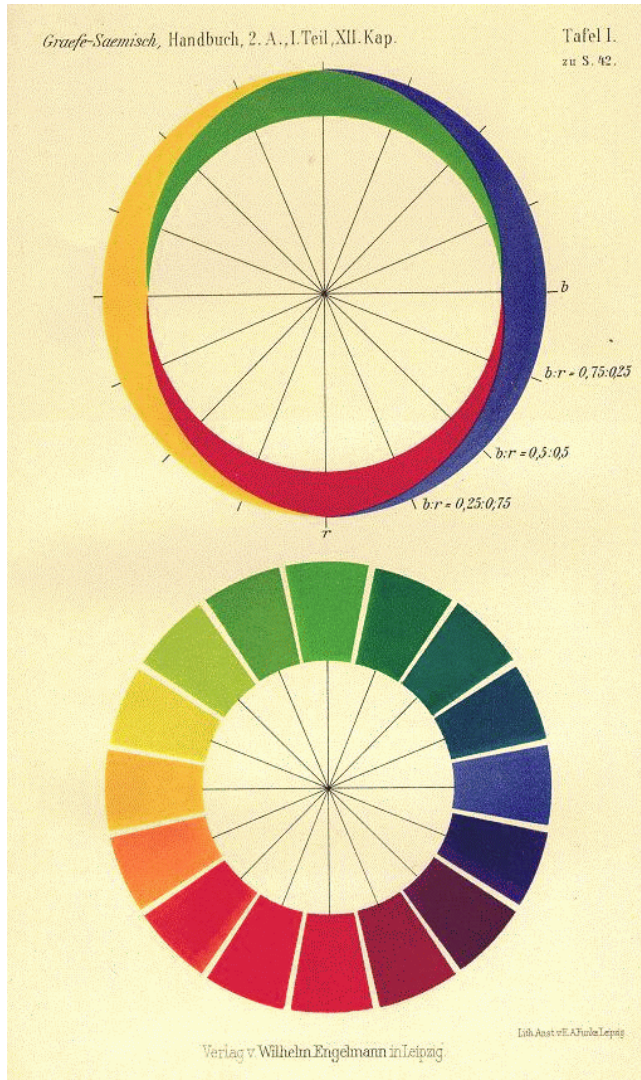
J. W. Goethe popsal pokus: „Podrž kousek papíru na mírně osvětlené bílé tabuli, upřeně se dívej na malou barevnou plochu a odstraň ji po nějaké době, aniž bys pohnul očima, pak uvidíš na bílé tabuli spektrum jiné barvy. Barevný jev vzniká z obrazu, který nyní náleží oku ... Tak žlutá vyžaduje fialovou, oranžová modrou, purpurová zelenou a obráceně.“



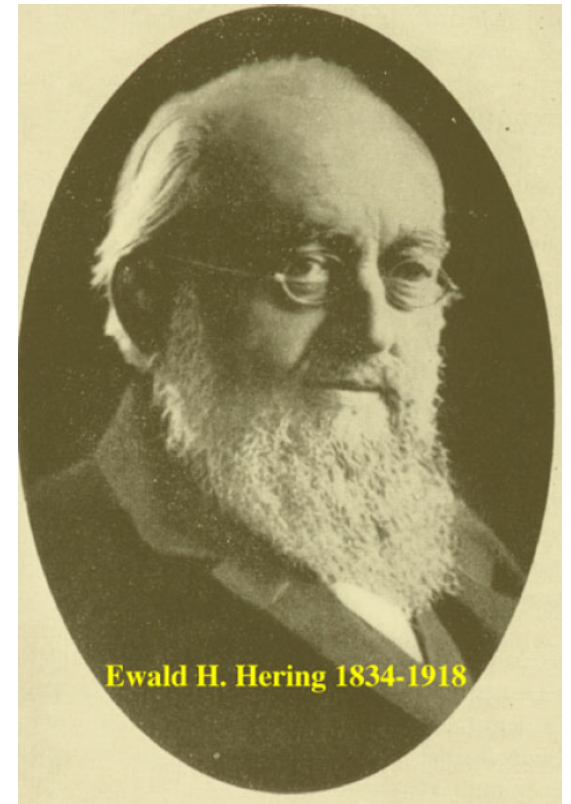
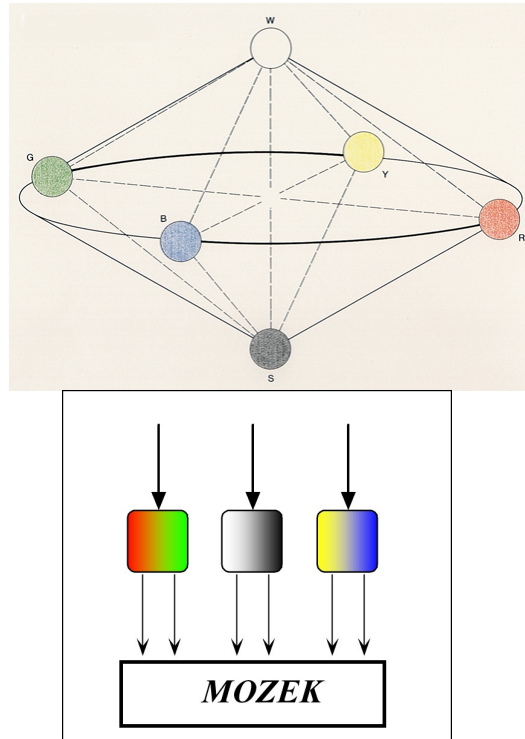




Karl Ewald Konstantin Hering (1834-1918)



1923

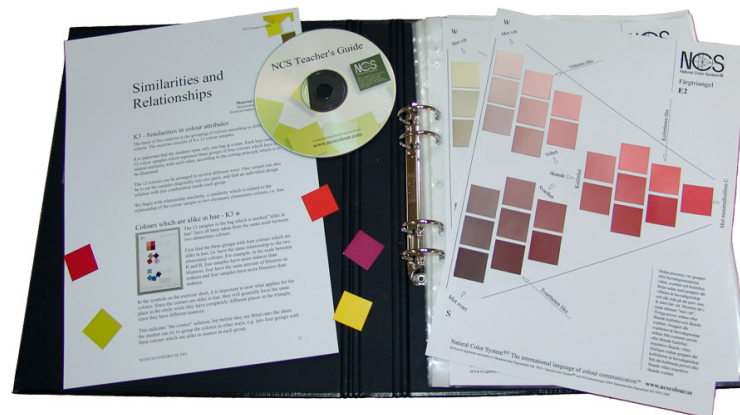


Natural Colour System I

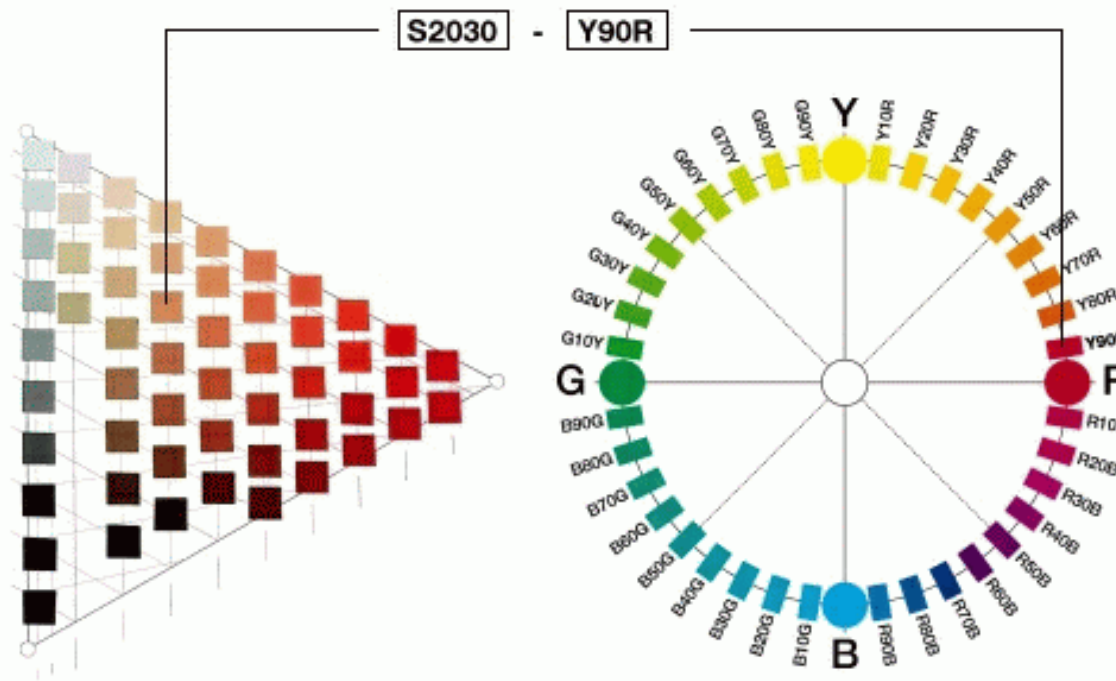
(Systém přirozeného uspořádání barev)



Dr Lars Sivik, Prof Gunnar Tonnquist and Dr. Anders Hård, 2004



Natural Colour System II



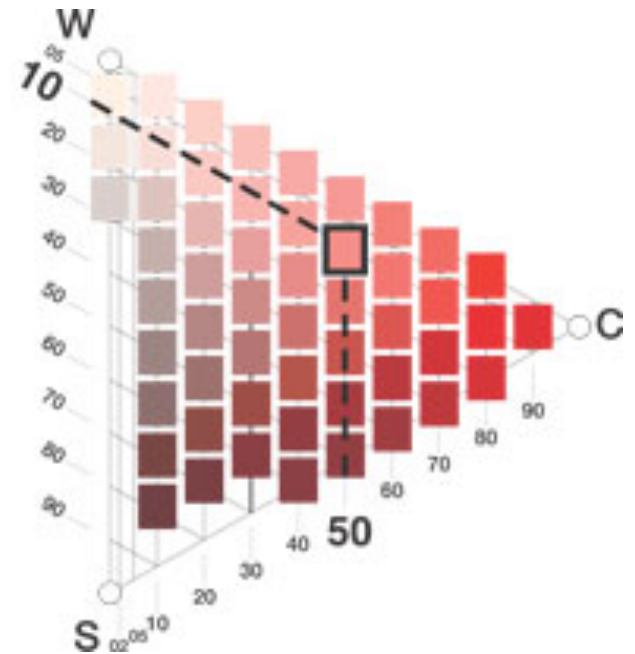
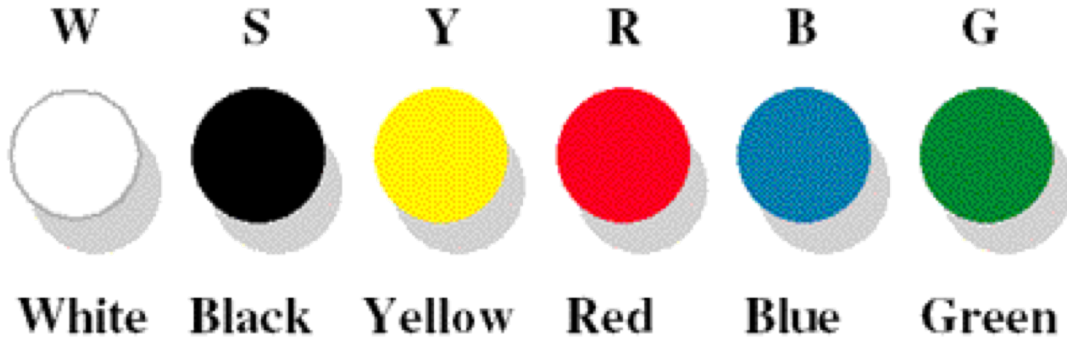
S 1050 - Y90R

Standard $\underbrace{\quad\quad\quad}_S \underbrace{\quad\quad\quad}_C$

blackness chromaticness

$\underbrace{\quad\quad\quad}$ Nuance $\underbrace{\quad\quad\quad}$ Hue

Φ



Natural Colour System III



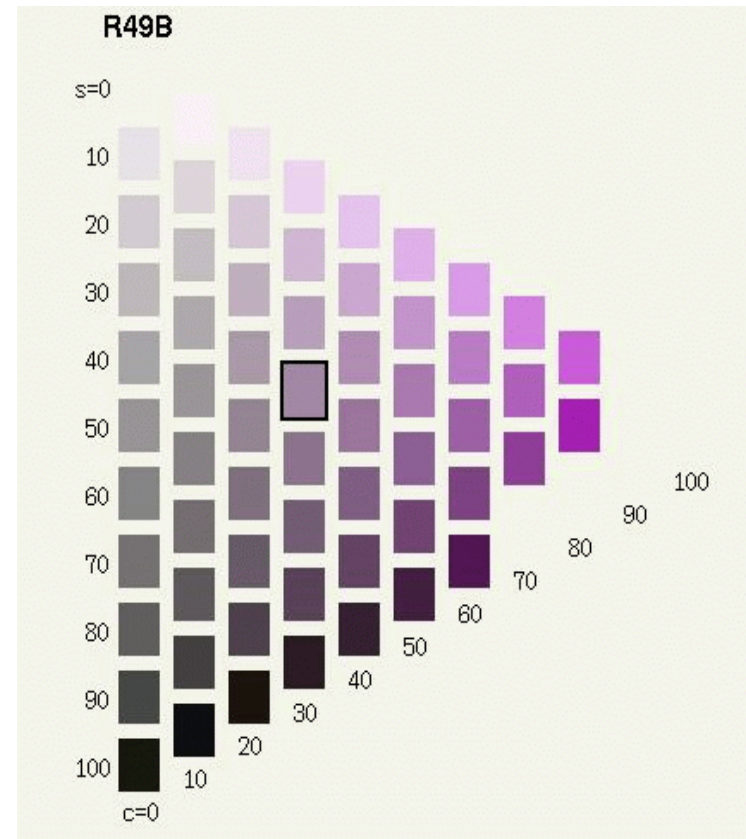
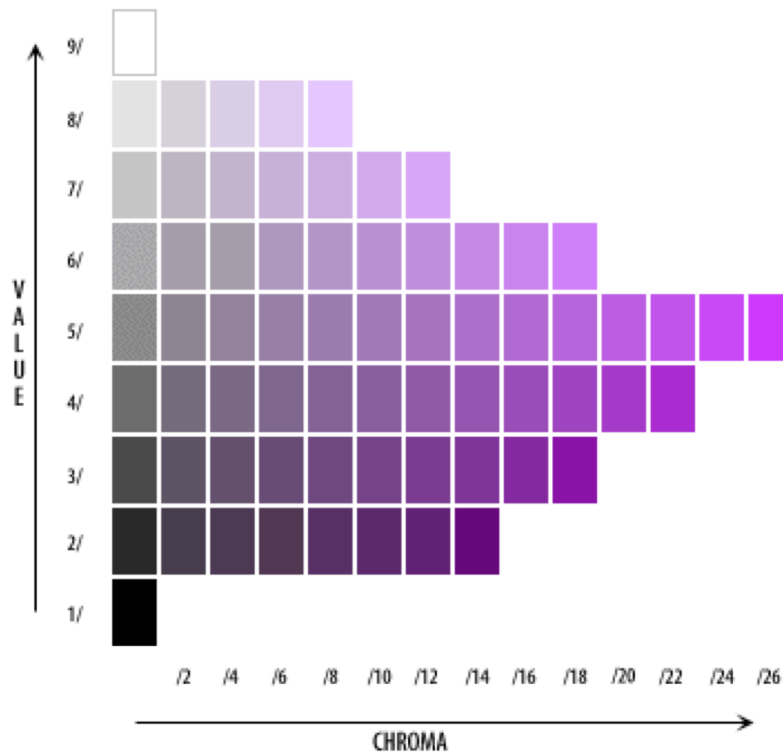
Natural Colour System IV



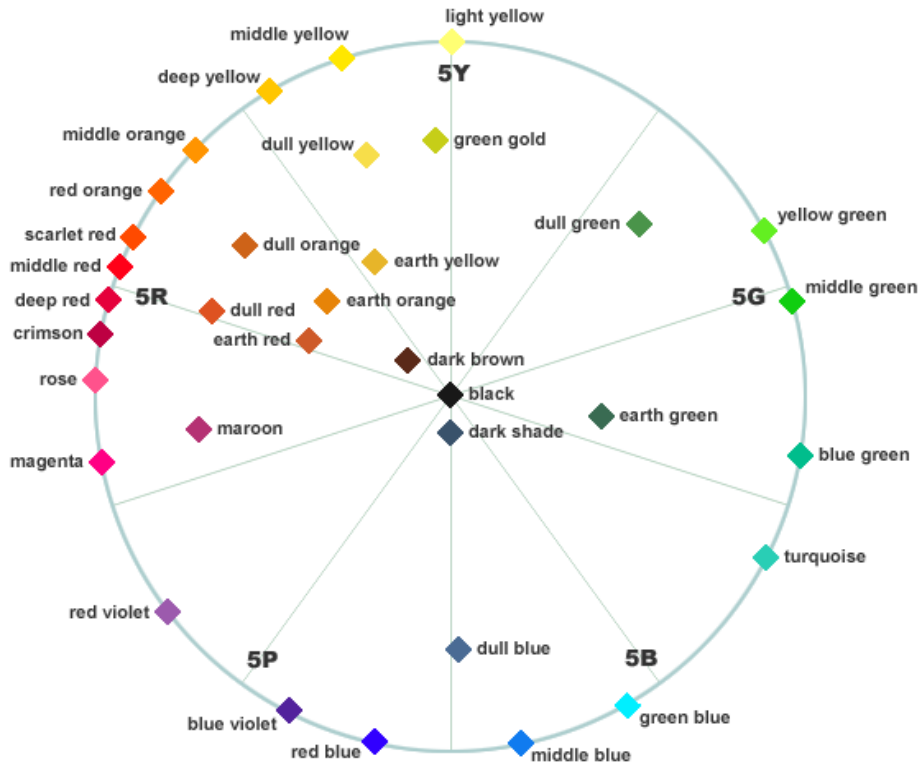
Natural Colour System versus Munsell Colour Notation I

- více chromatický
- rovnoměrně odtupňovaný
- nelze použít pro vzorování a odhad receptury
- nesymetrické těleso

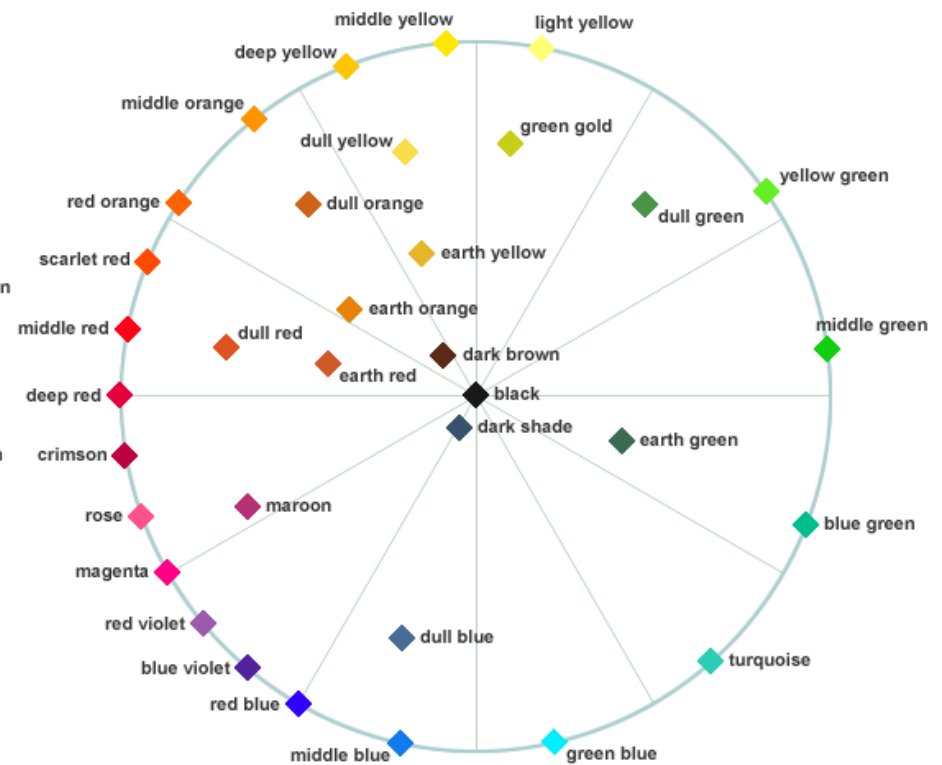
- lze poměrně dobře vytvořit recepturu
- nerovnoměrně odstupňovaný
- lze použít pro vzorování
- symetrické těleso



Natural Colour System versus Munsell Colour Notation II

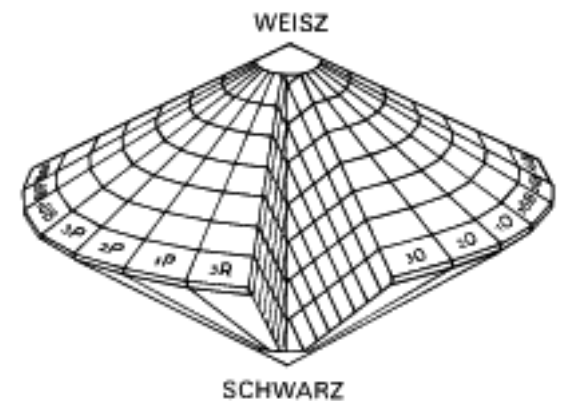
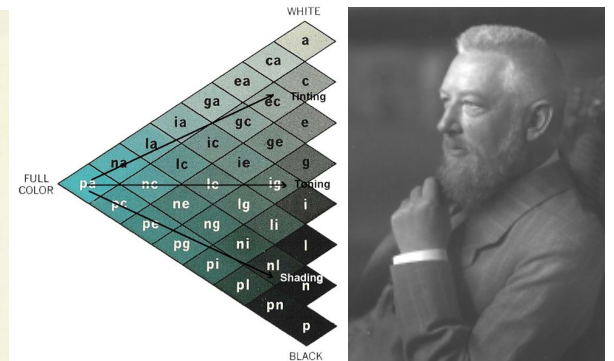
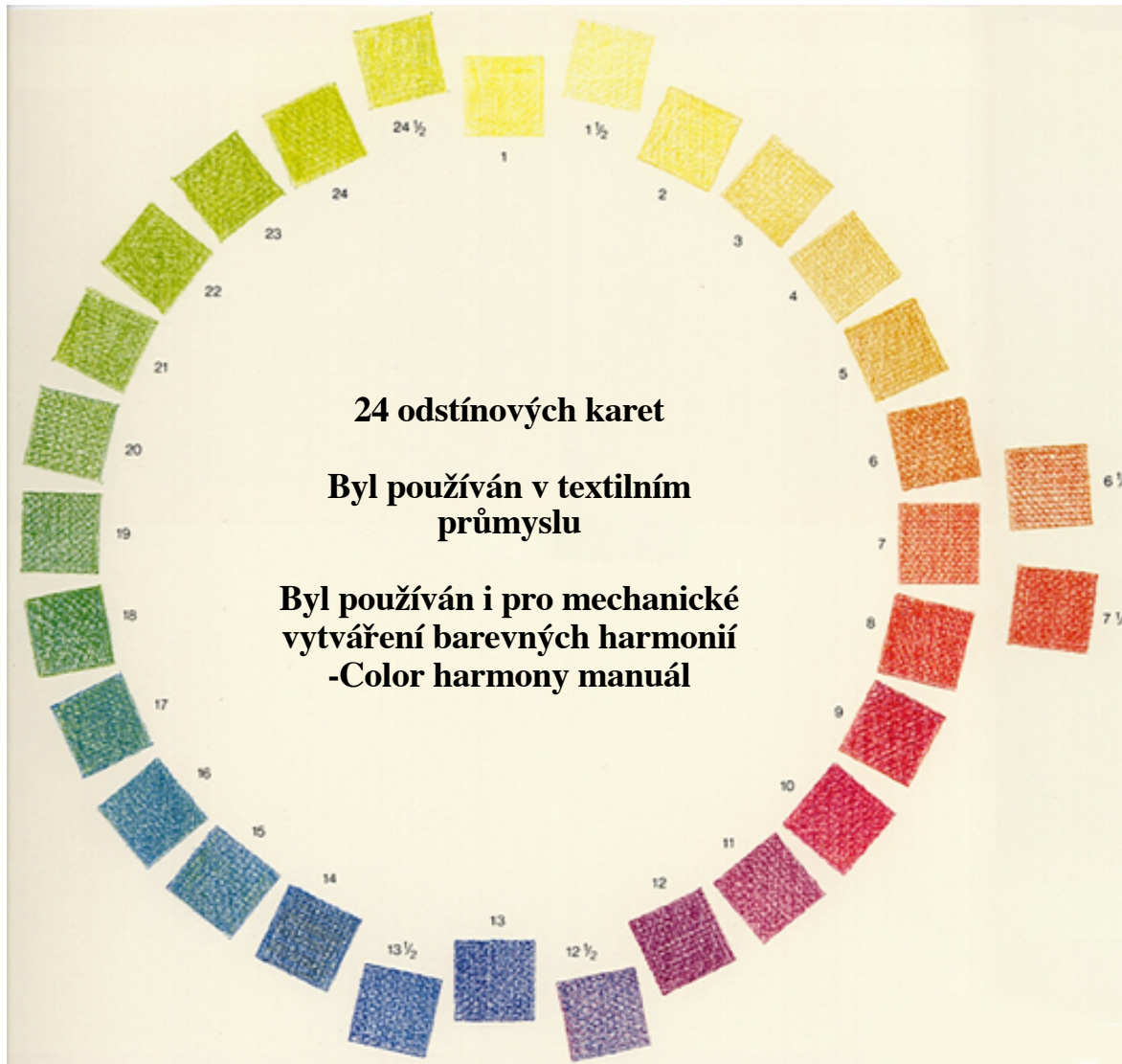


Munsell



NCS

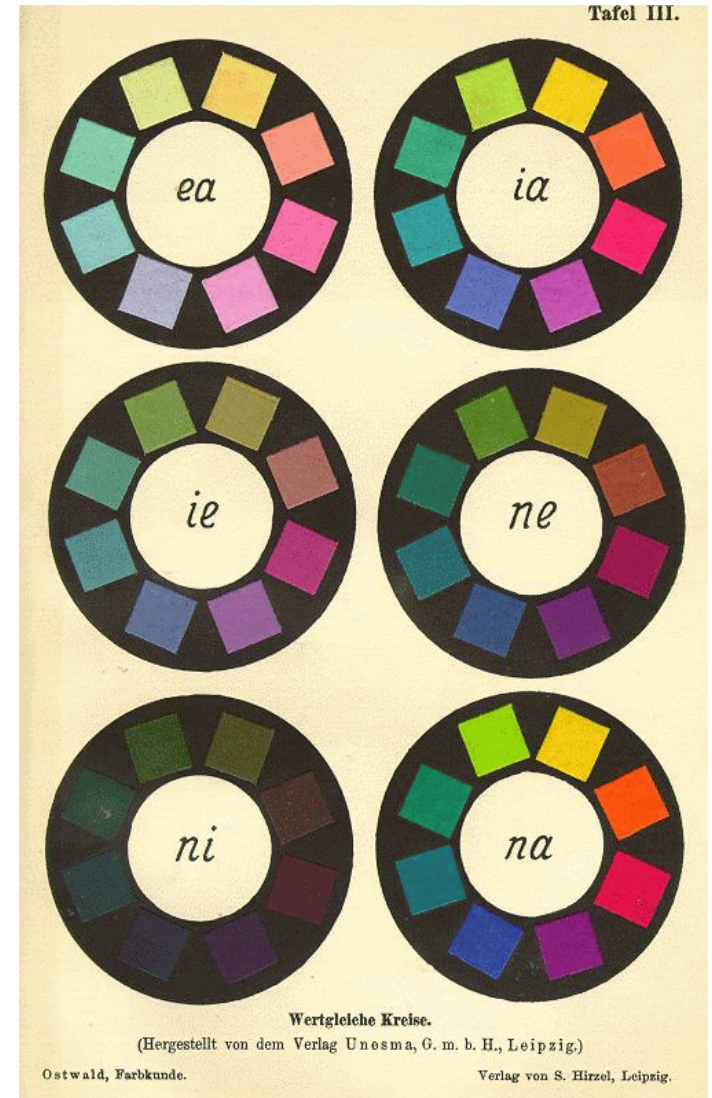
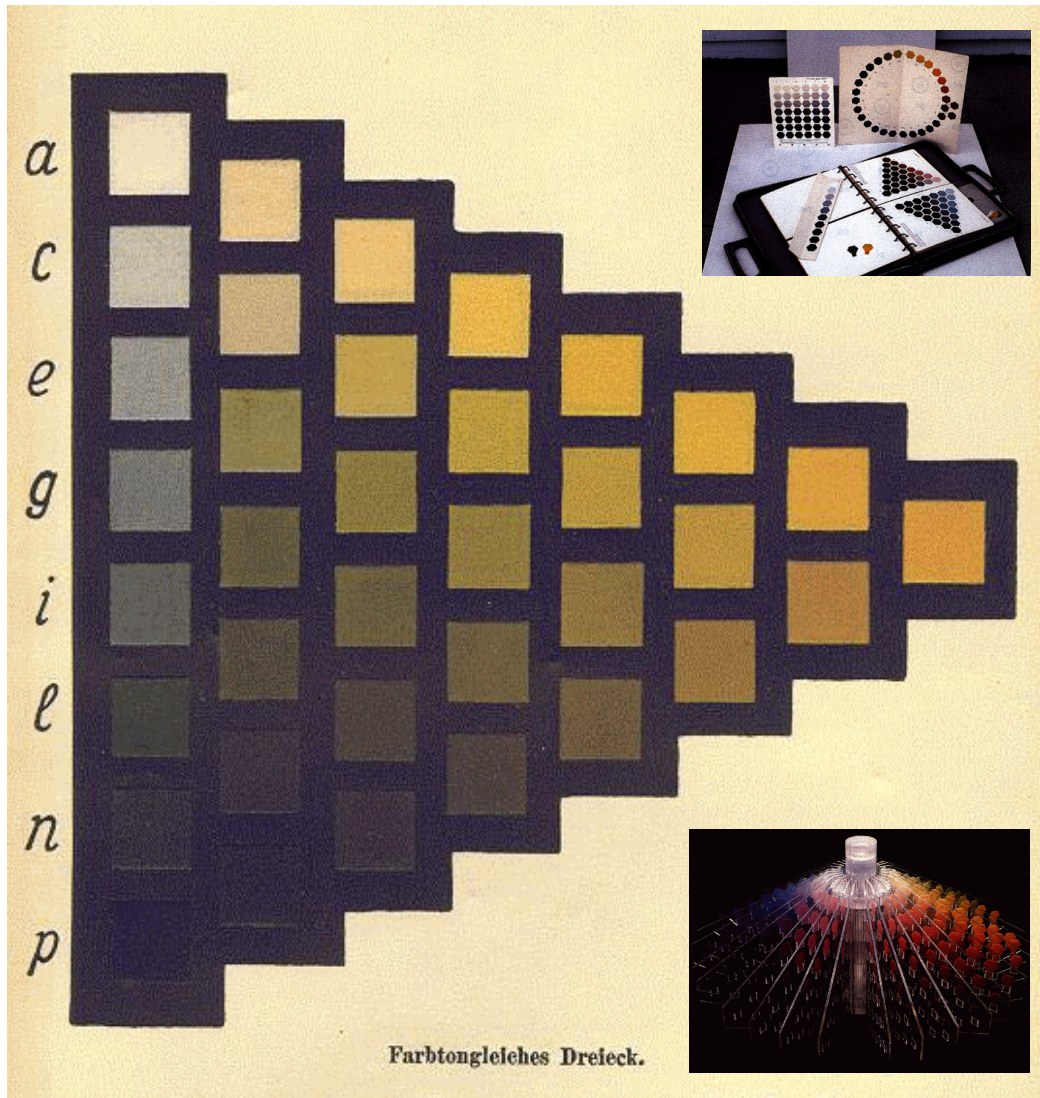
Wilhelm Ostwald (1853-1932)



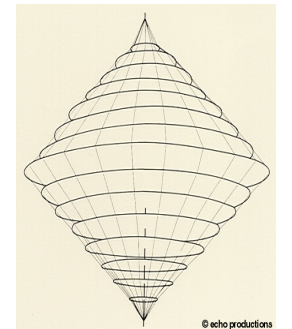
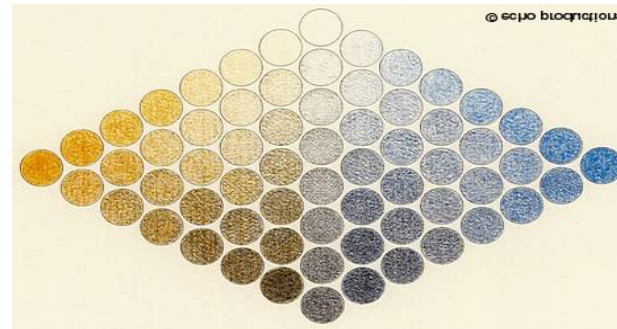
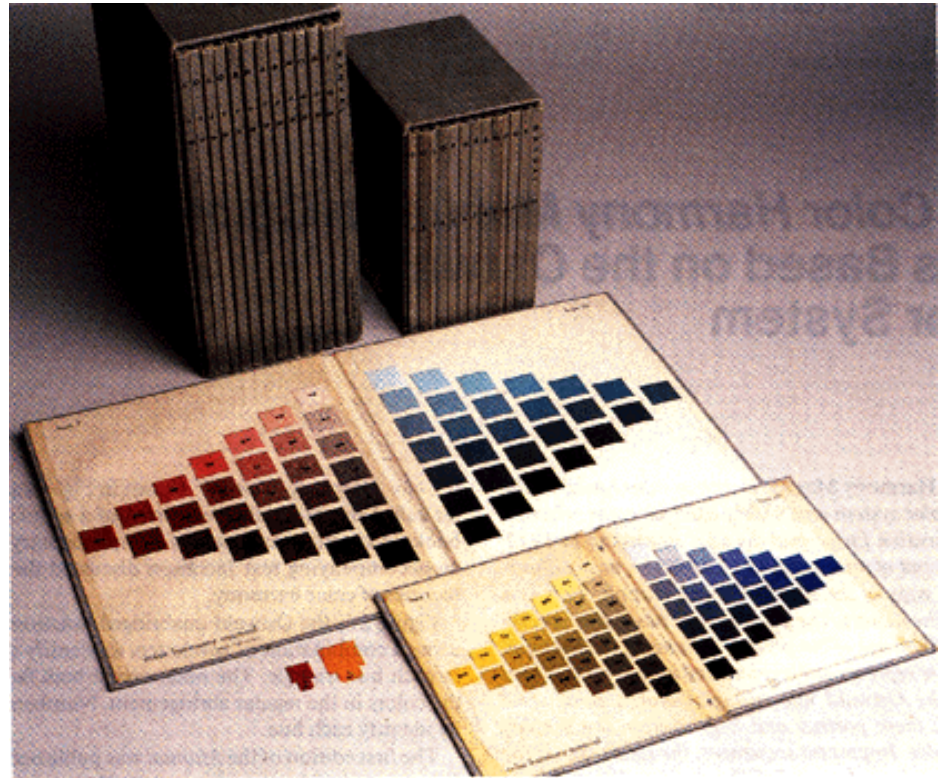
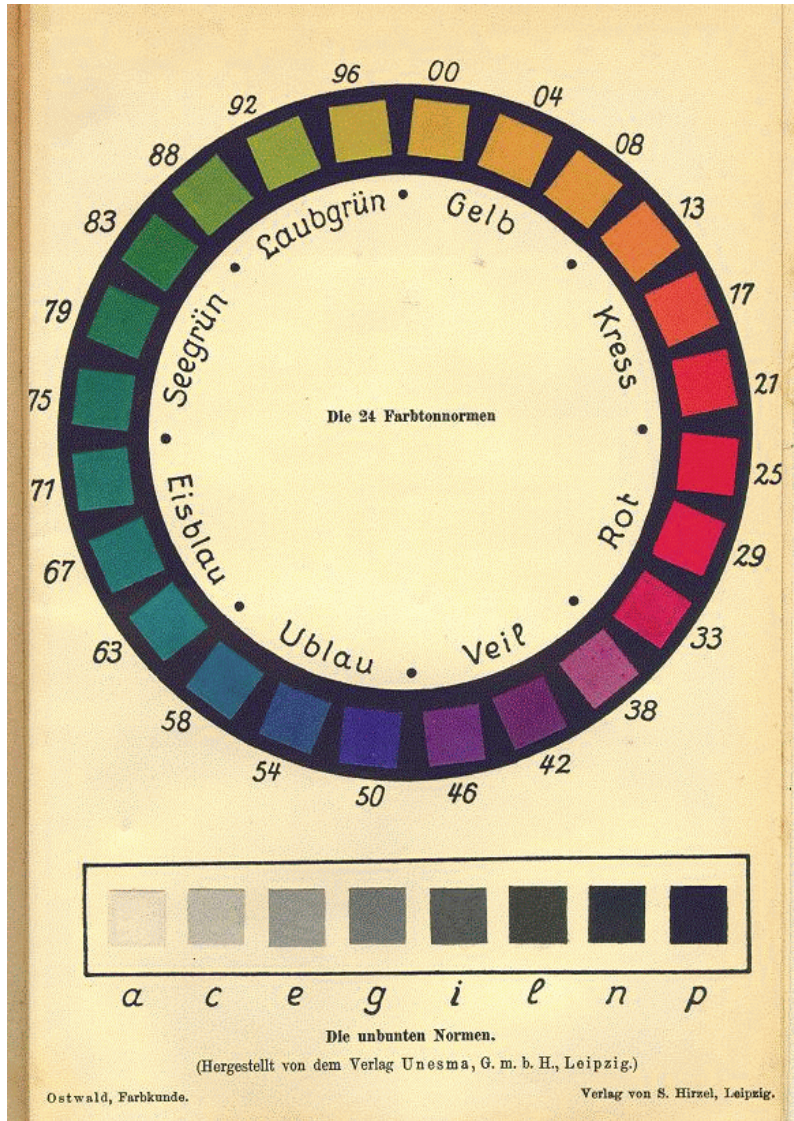
OSTWALD

1917

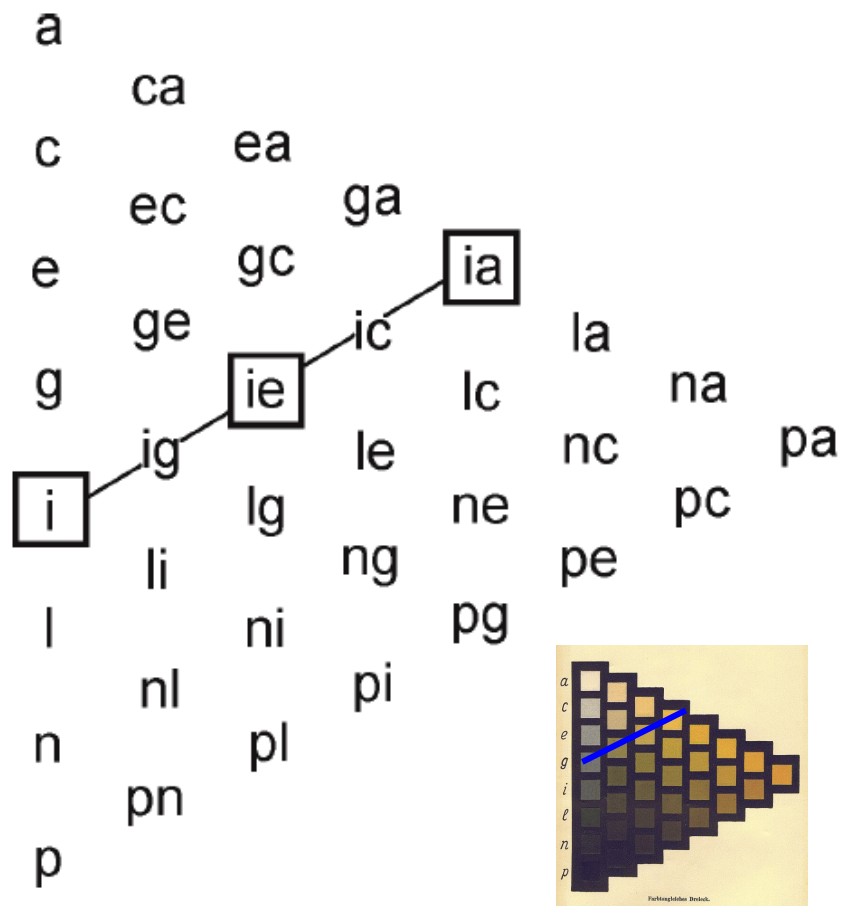
Ostwaldův systém barev I



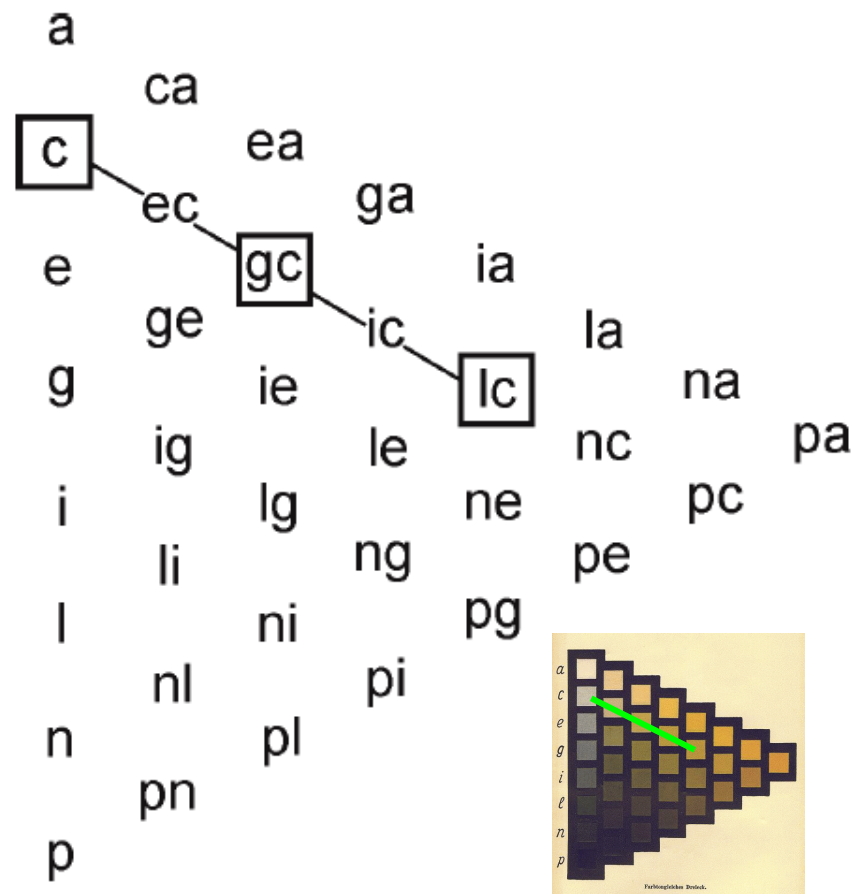
Ostwaldův systém barev II



Ostwaldův systém barev III

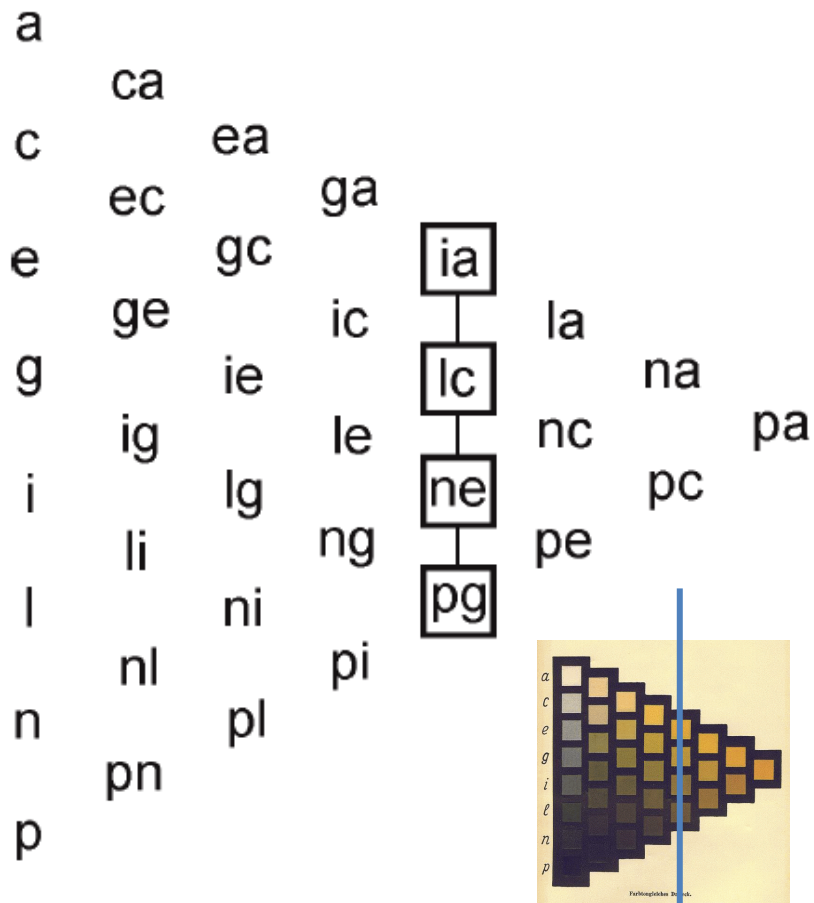


Stejná koncentrace bílé (equiharmonie bílé)

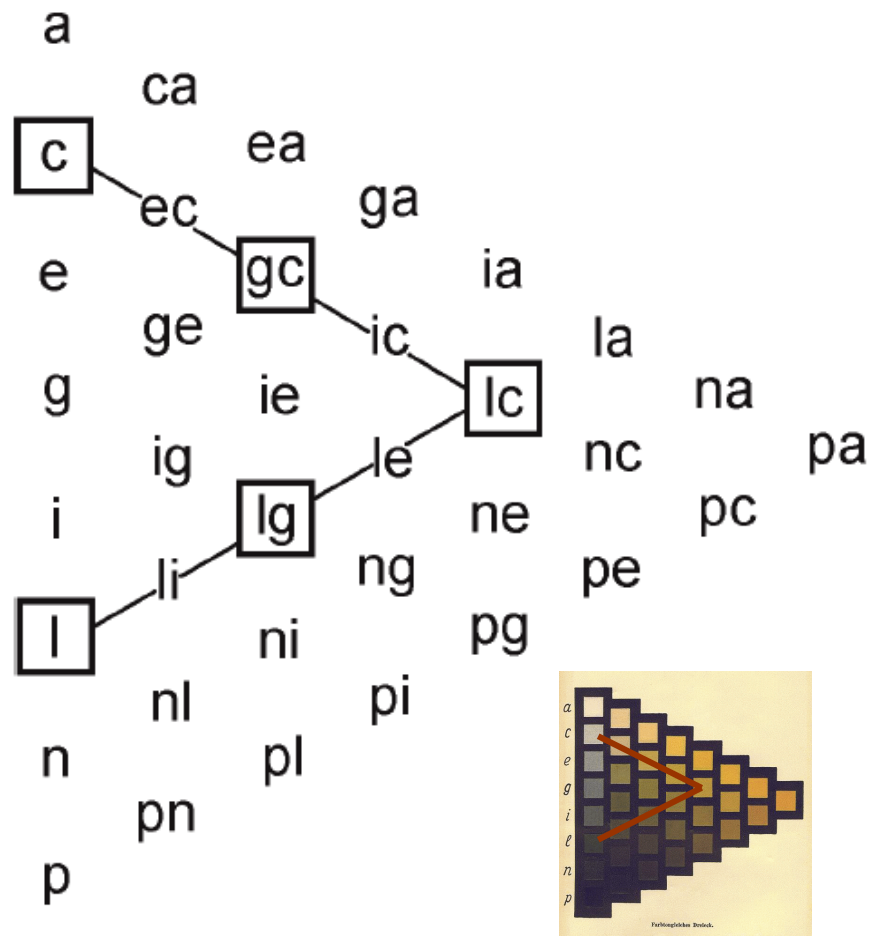


Stejná koncentrace černé (equiharmonie černé)

Ostwaldův systém barev IV



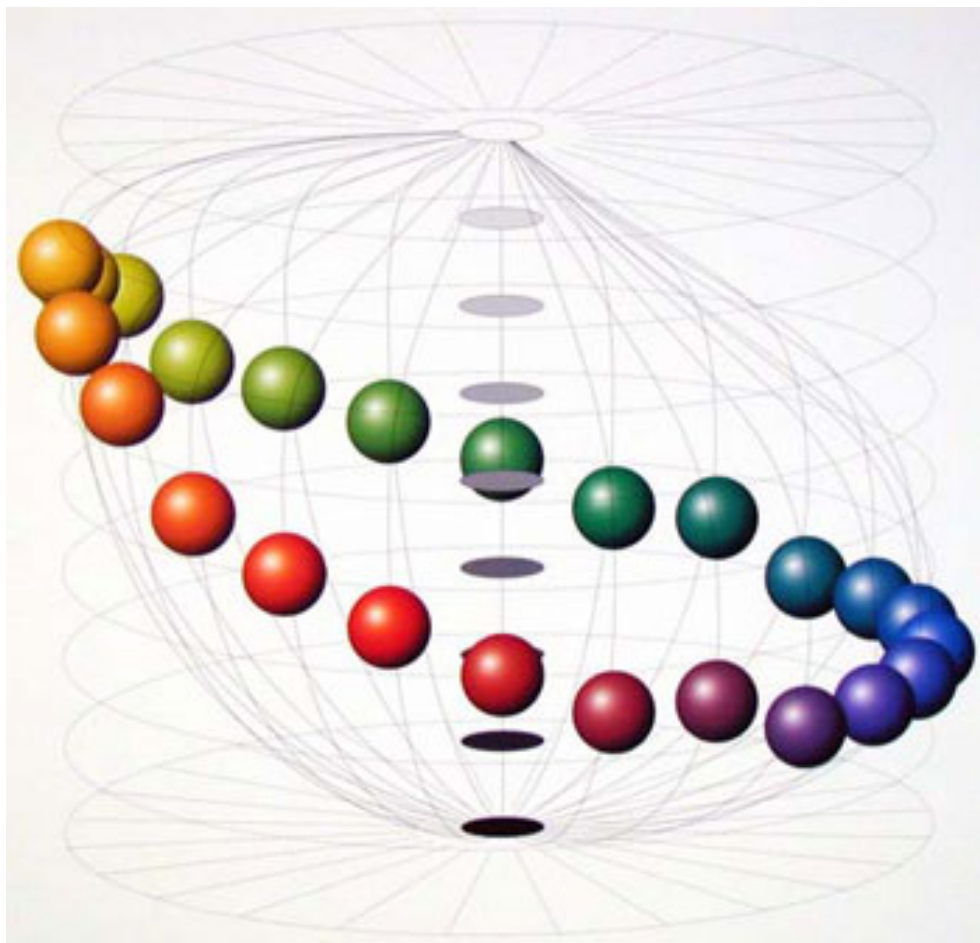
Stjná čistota (equichromacita)



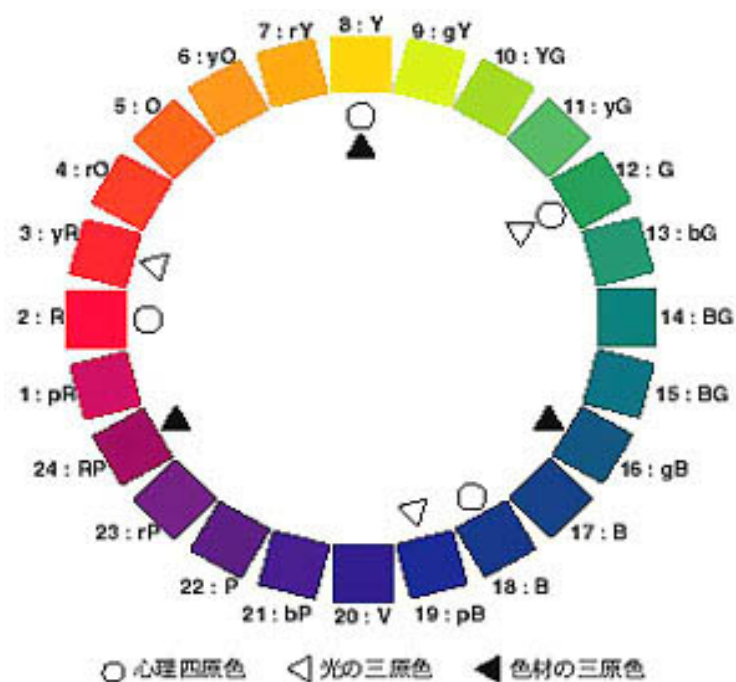
Monochromatická harmonie

PCCS I

[Practical Color Co-ordinate System]

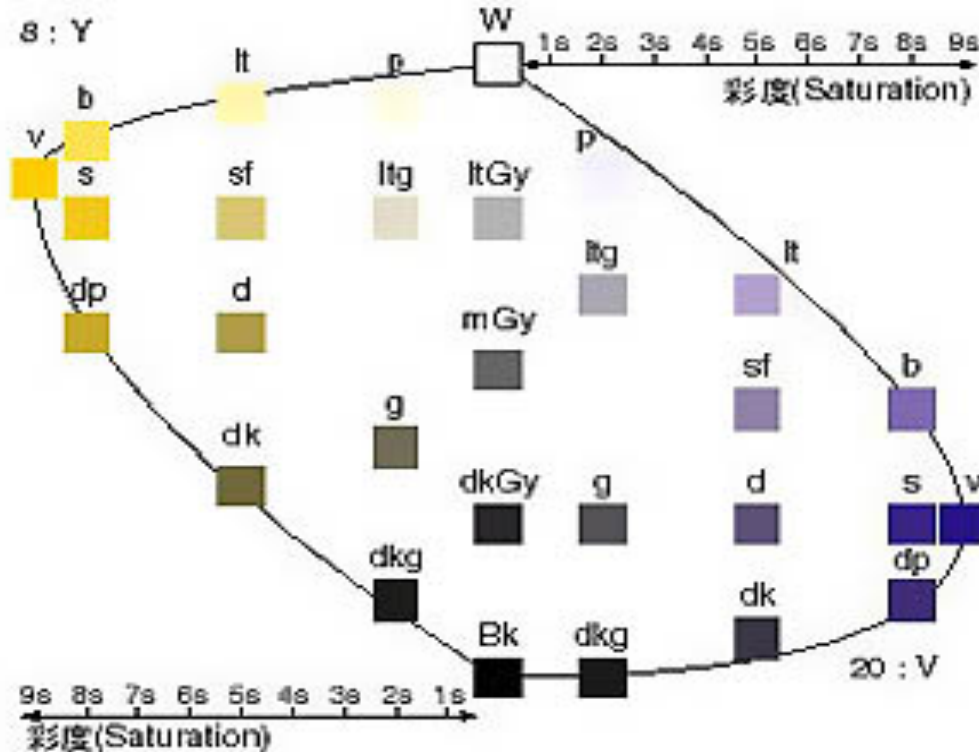


PCCS byl vytvořen v roce 1964 v Japan Color Research Institute. Je založen na desetiletém výzkumu barevných harmonií



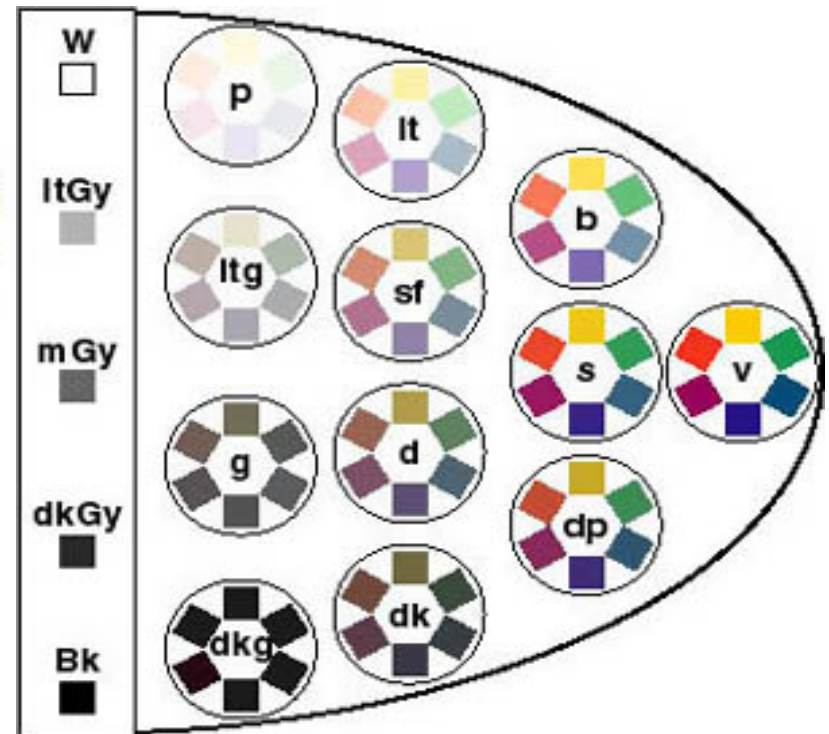
PCCS II

[Practical Color Co-ordinate System]

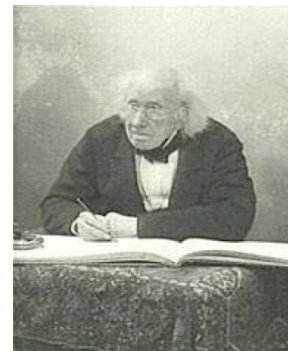
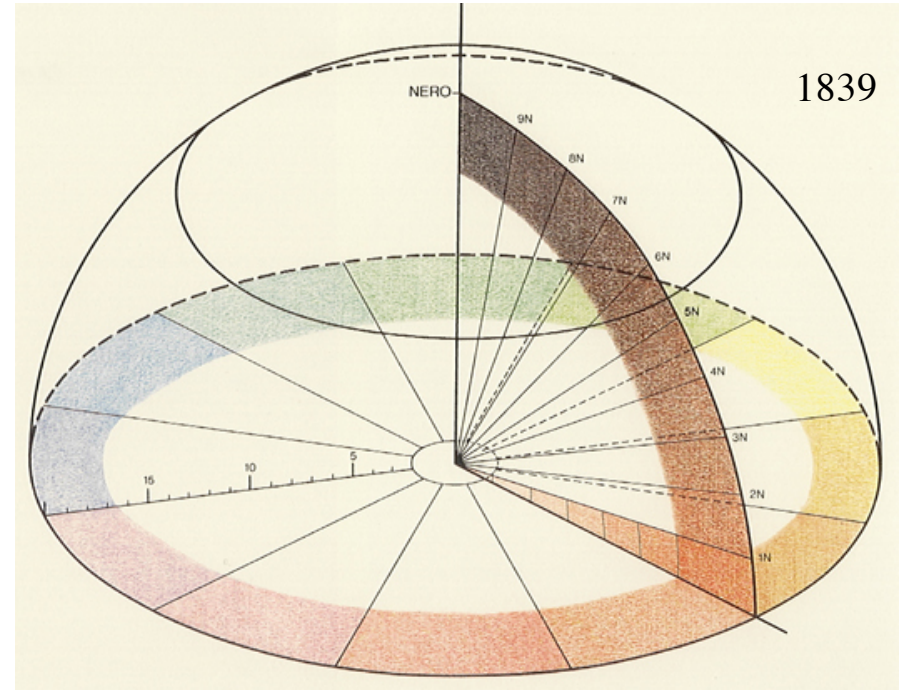
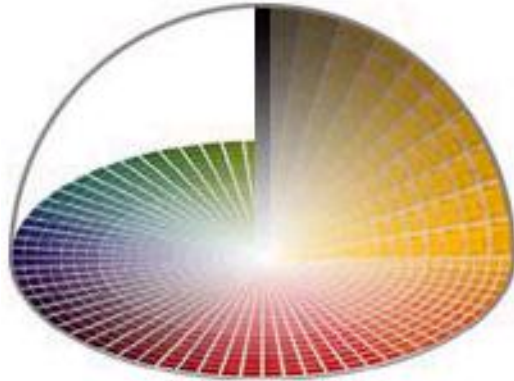
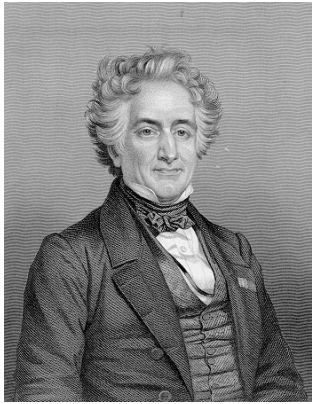


PCCS svou strukturou připomíná Munsellův atlas barev, nicméně je založen na rozdílné technice škálování

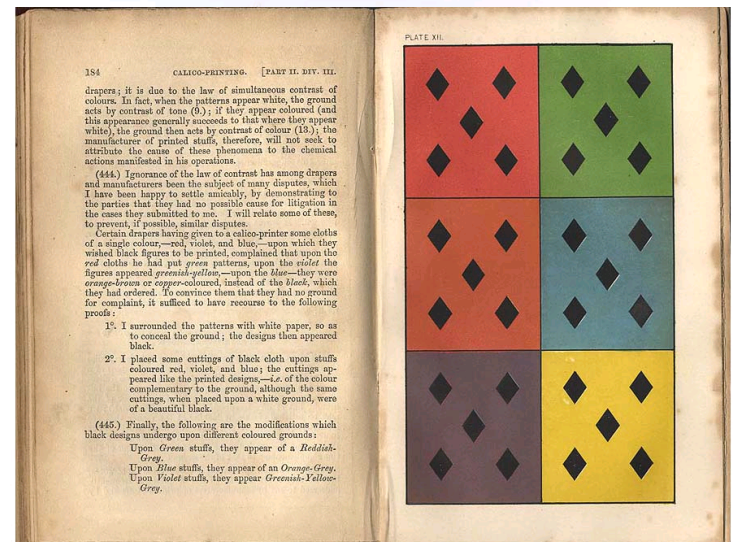
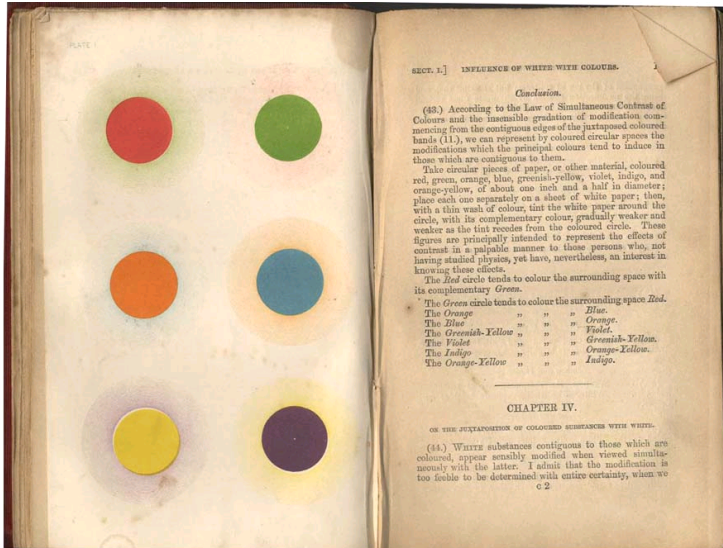
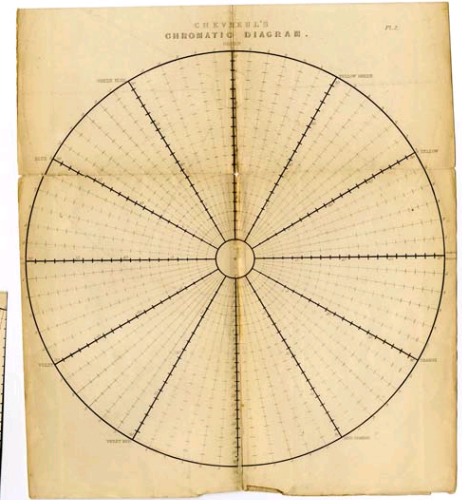
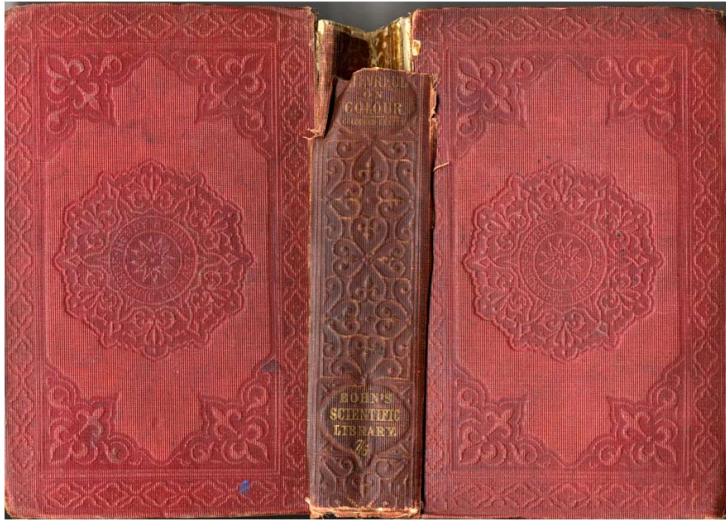
PCCS rovněž dokumentuje problém rozdílné světlosti při maximálních čistotách odstínů.



Michel Eugène Chevreul (1786-1889)



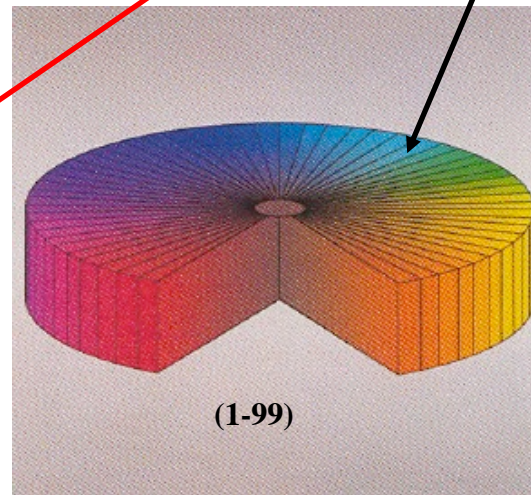
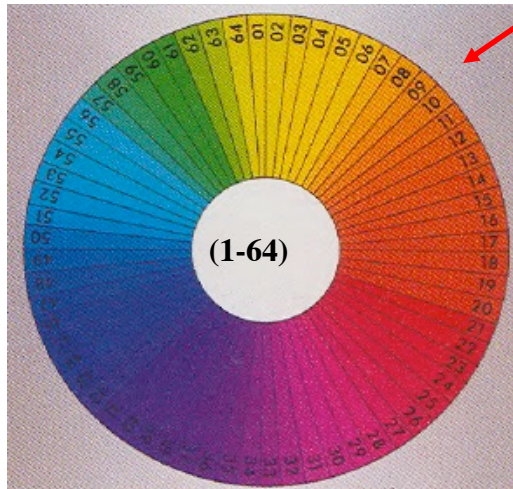
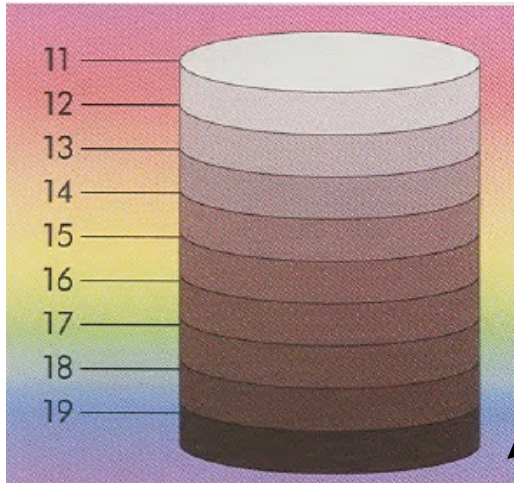
Michel Eugène Chevreul II





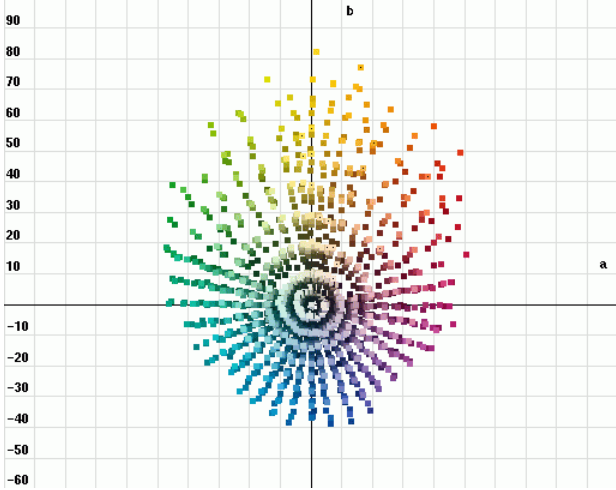
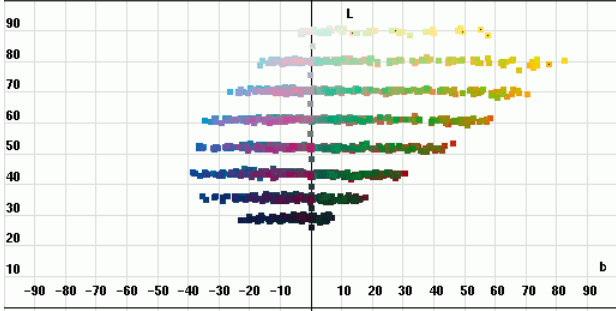
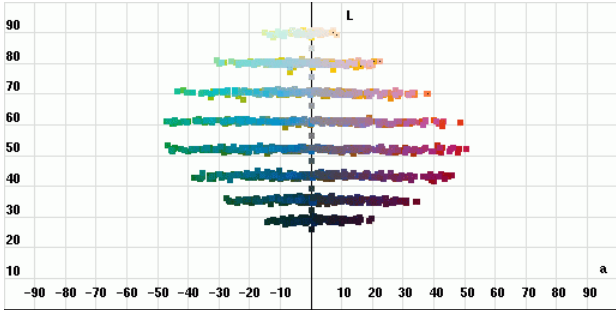
COLOR PLATE I. This is described in (43.). With it Chevreul endeavors to demonstrate the fringe effects of induced colors upon staring at disks of pure colors on a white ground.

Pantone I



Číselník barev – uspořádání podle kódového značení

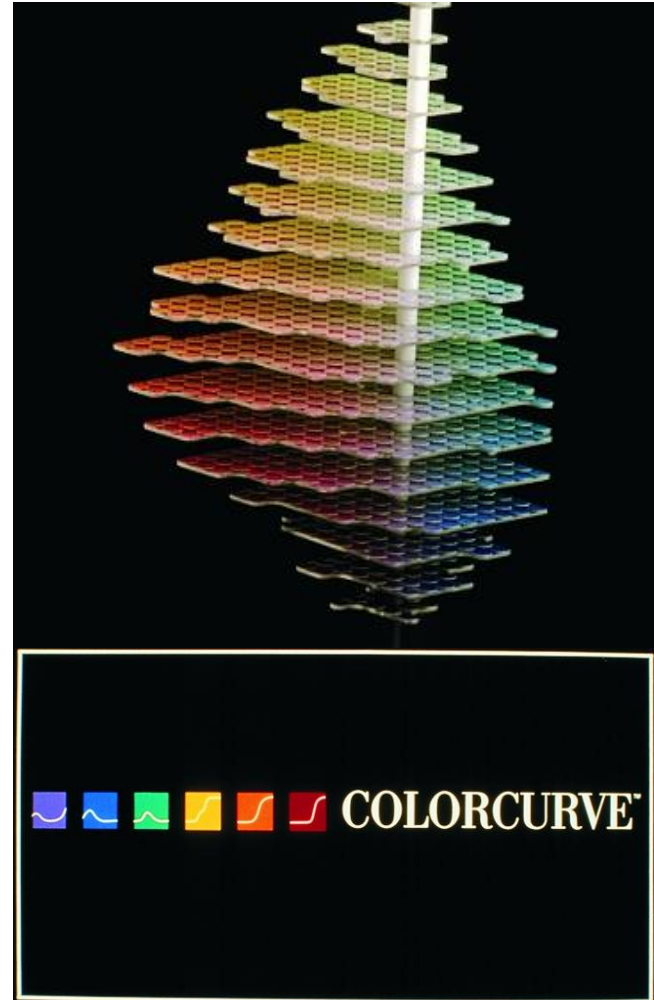
Pantone II



Pantone III



Colorcurve I



Colorcurve II

- Světlost (L)
 - Nabývá stejných hodnot jako CIE L*
- Red(R), Yellow(Y), Green(G) and Blue(B)
 - Uspořádání odstínů odpovídá osám a* b* v kolorimetrické soustavě CIELAB
 - Rozsah hodnot od 0 (šedá) do 9(pestrá)

- Na příklad vzorek:

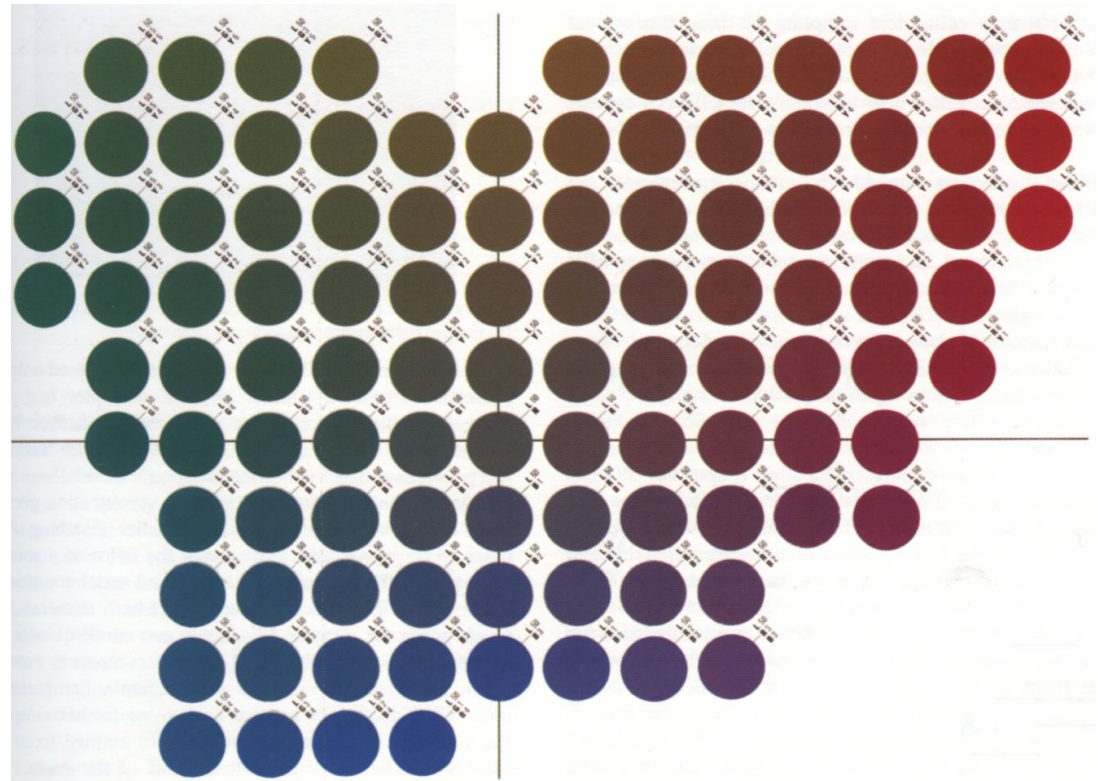
L55 G2 Y4

→ má souřadnice

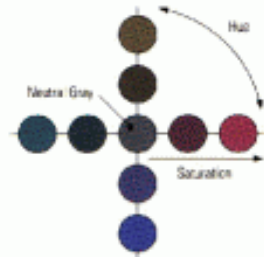
$L^* = 55,$

$a^* = -10.93,$

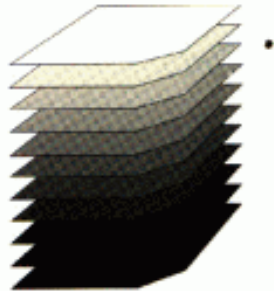
$b^* = 22.37$



Colorcurve III



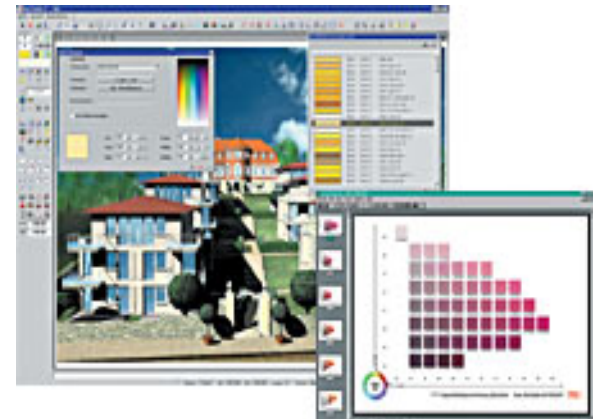
Each Level in the Master Atlas first relates colors by hue and saturation, allowing a designer to isolate the key variables in a color's appearance.



Further refinements in color selection are possible by comparing samples between Levels. The Master Atlas has 10 Levels, with samples ranging from the lightest pastels to the deepest colors.



RAL



DIN6164 I



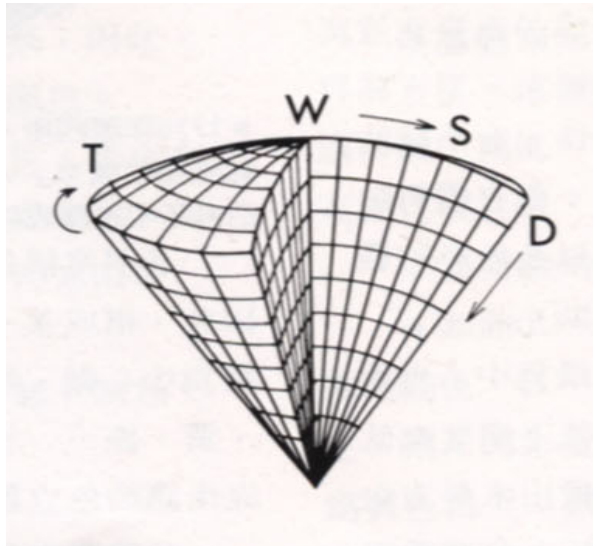
MANFRED RICHTER
(1905-1990)

Princip: Rovnoměrné vizuální odstupňování ve všech třech proměnných :

(T) tint, (S) sättigungsstufe a (D) dunkelstufe

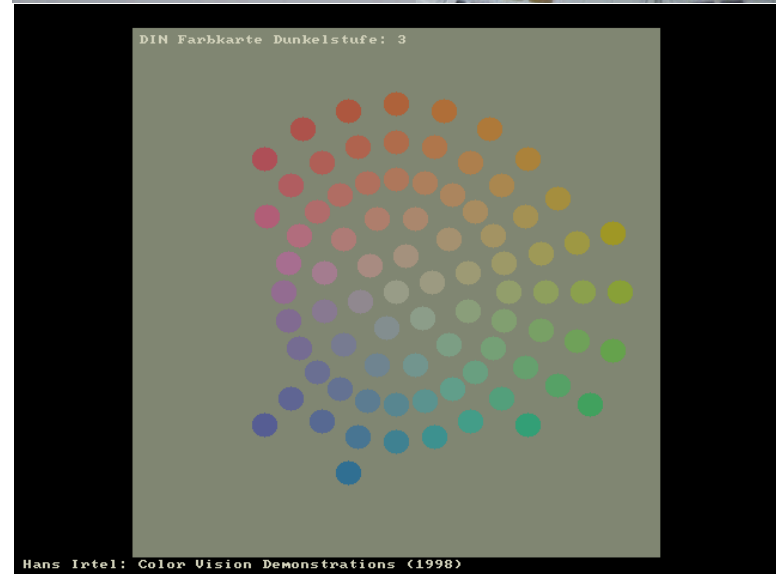
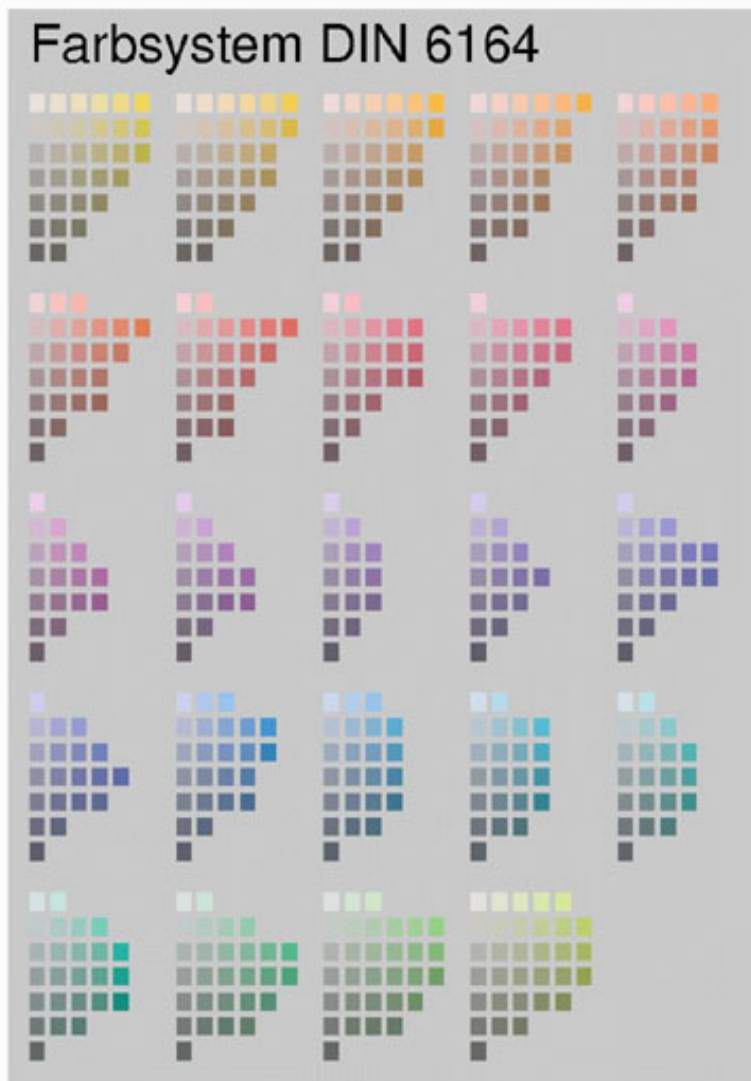
Historie

- **1953 Color chart - transparent gelatin filters**
- **1962 Color chart – 600 matte samples**
- **1980 DIN 6164 colorimetric specification**
- **1983 Color chart – 1000 matte samples**



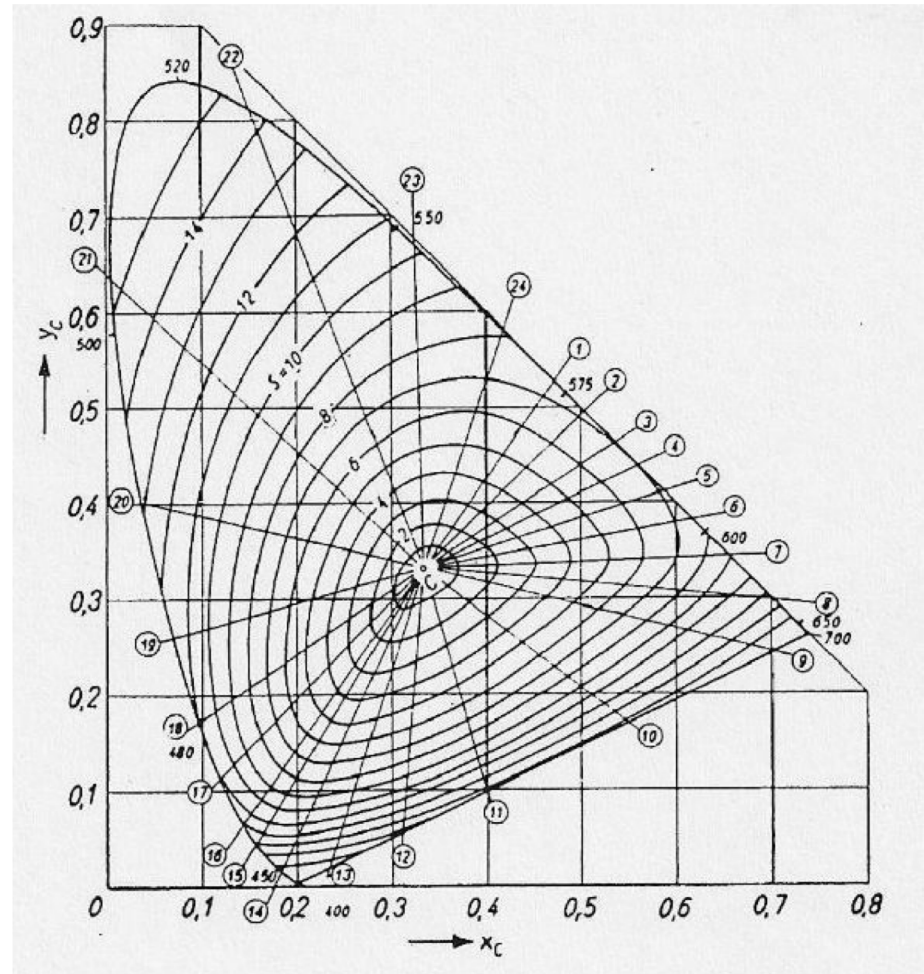
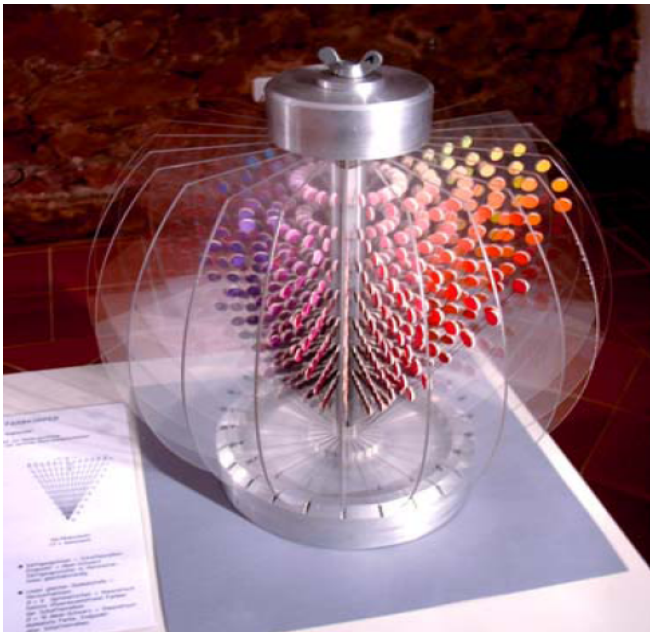
- **Odstín (T)**
 - 24 základních odstínů začínajících od žluté T = 1 vizuálně rovnoměrně seřazené
- **Sytost (S)**
 - Vizuálně rovnoměrně odstupňovaná čistota od šedé 0 do 15 se shodnou světlostí
- **Světlost (D)**
 - Relativní brilance vztažená k odpovídající optimální barvě

DIN6164 II



DIN6164 II

- DIN 6164
 - $D = 10 - 6.1723 \log_{10} (40.7 \frac{A}{A_0} + 1)$
 - kde $A = Y$ and A_0 je odraz optimální barvy korigovaný na spektrální luminózní funkci



Zobrazení DIN6164 v CIE x,y kolorimetrickém trojúhelníku