

# Munsell's Legacy: Foundation & Laboratory

***Mark Fairchild***

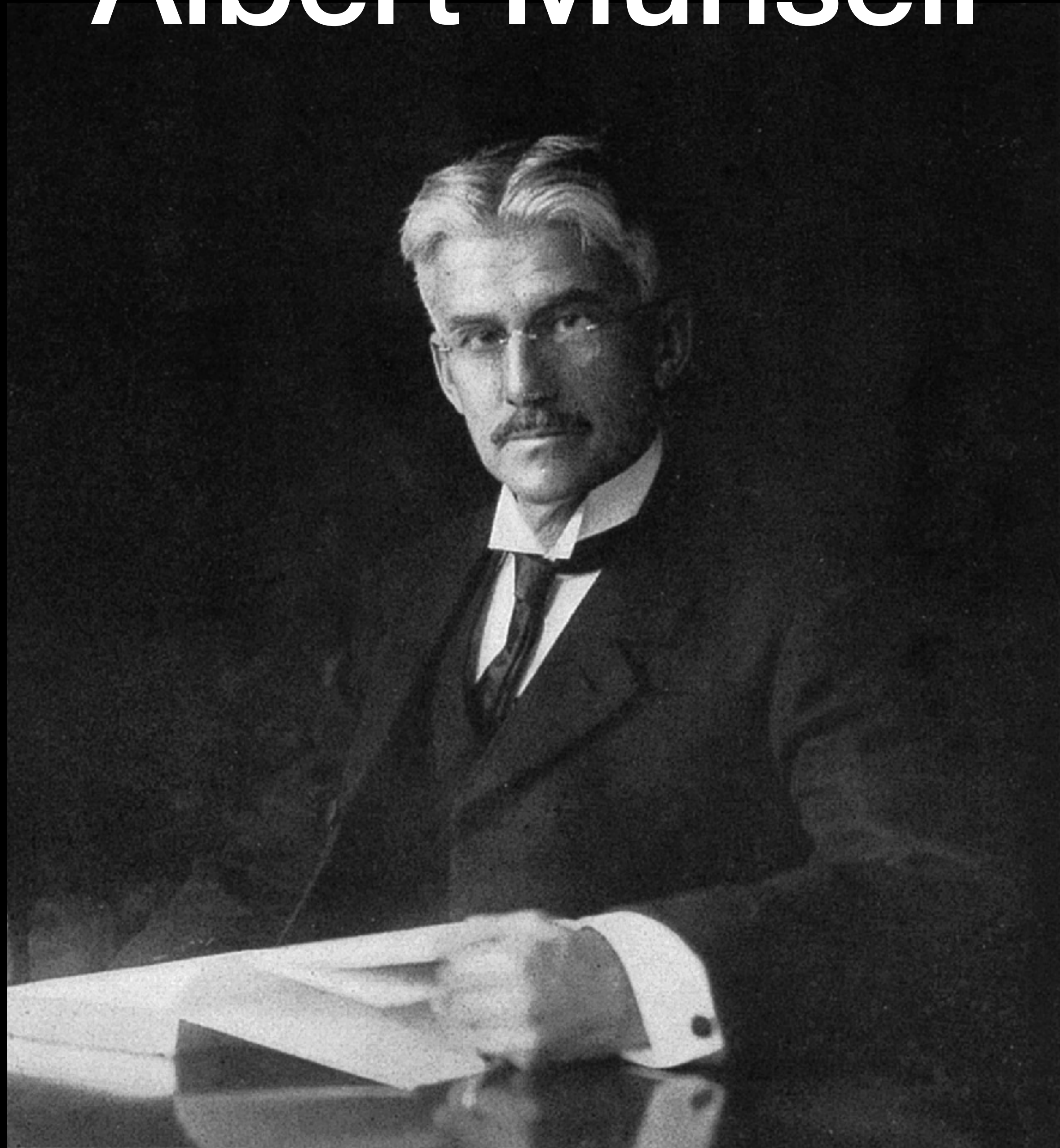
Rochester Institute of Technology

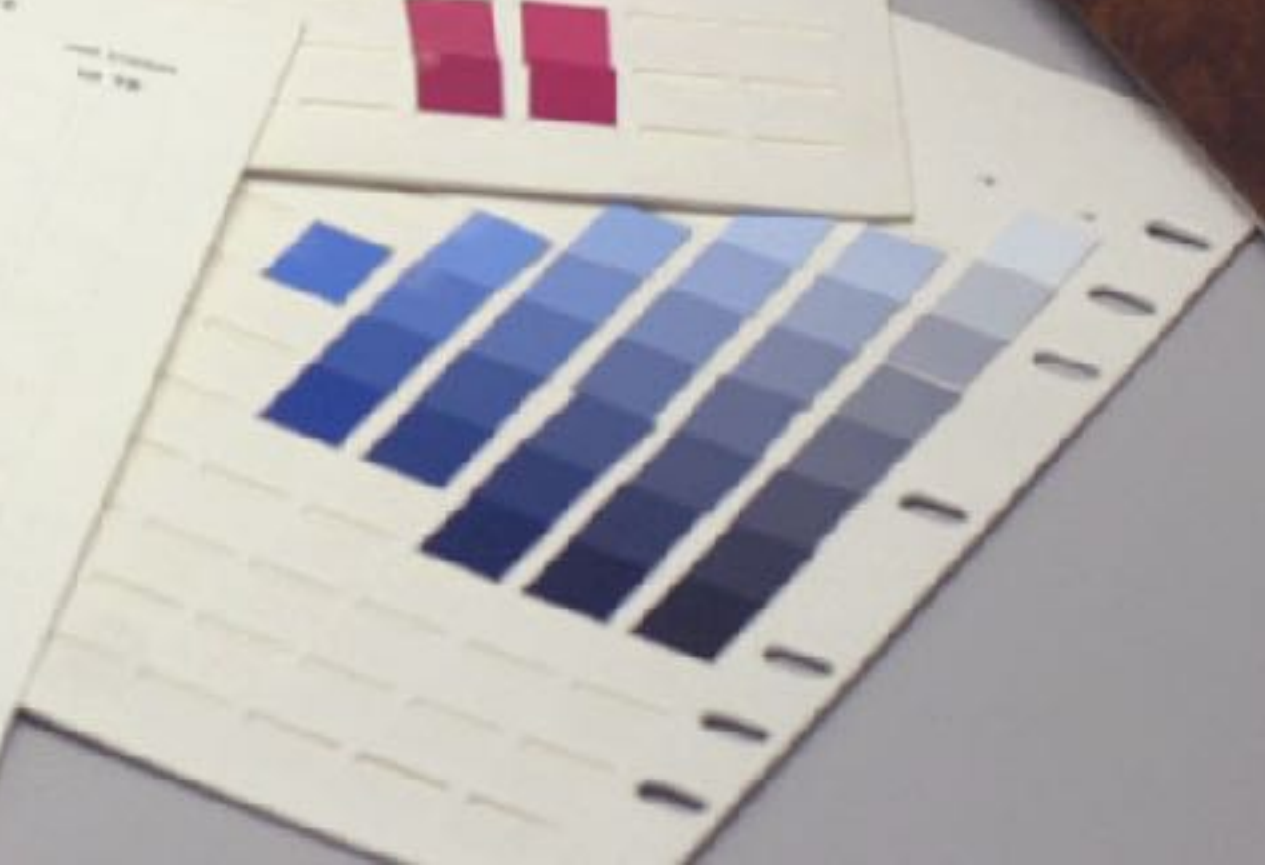
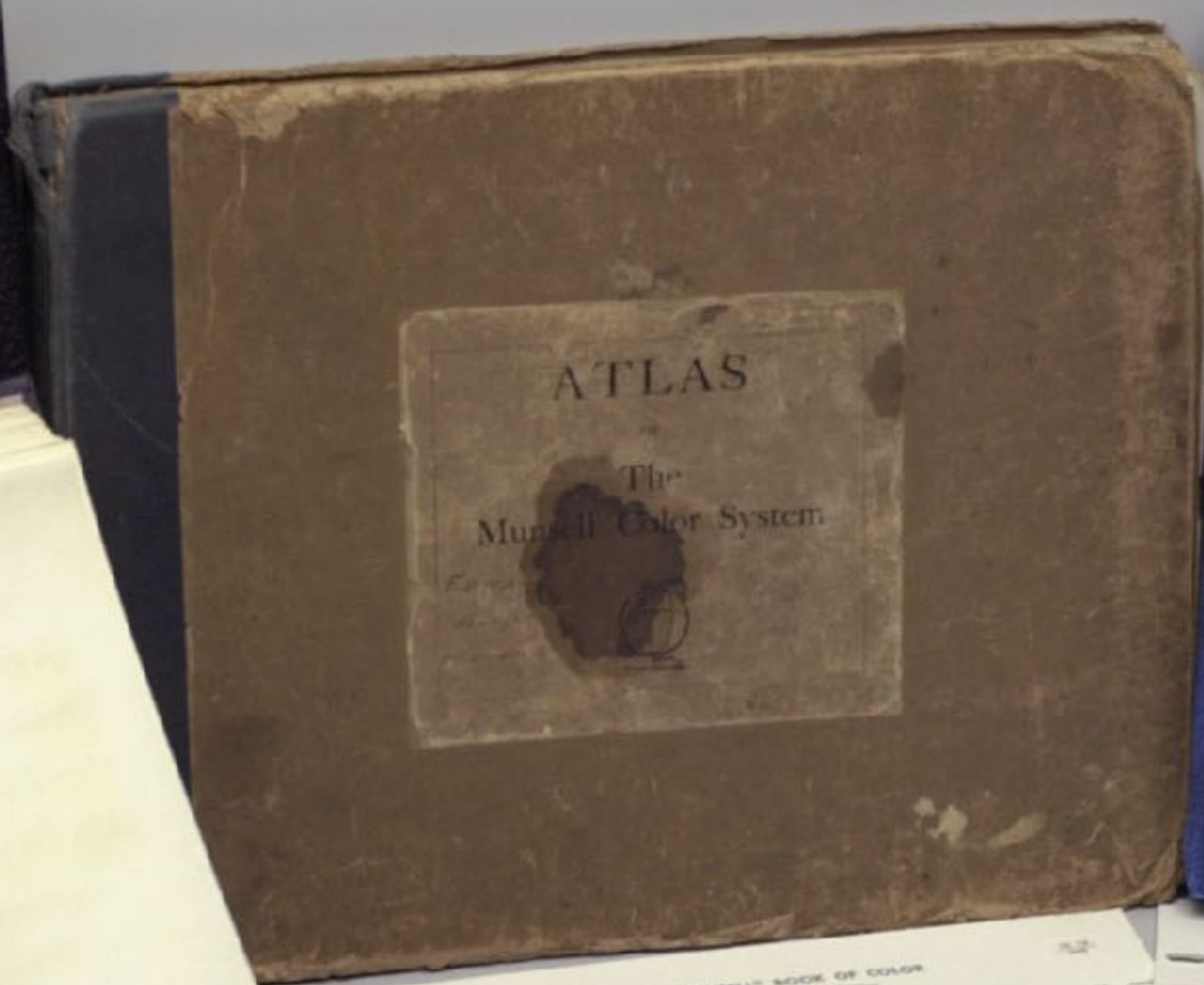
Integrated Sciences Academy

Program of Color Science / Munsell Color Science Laboratory

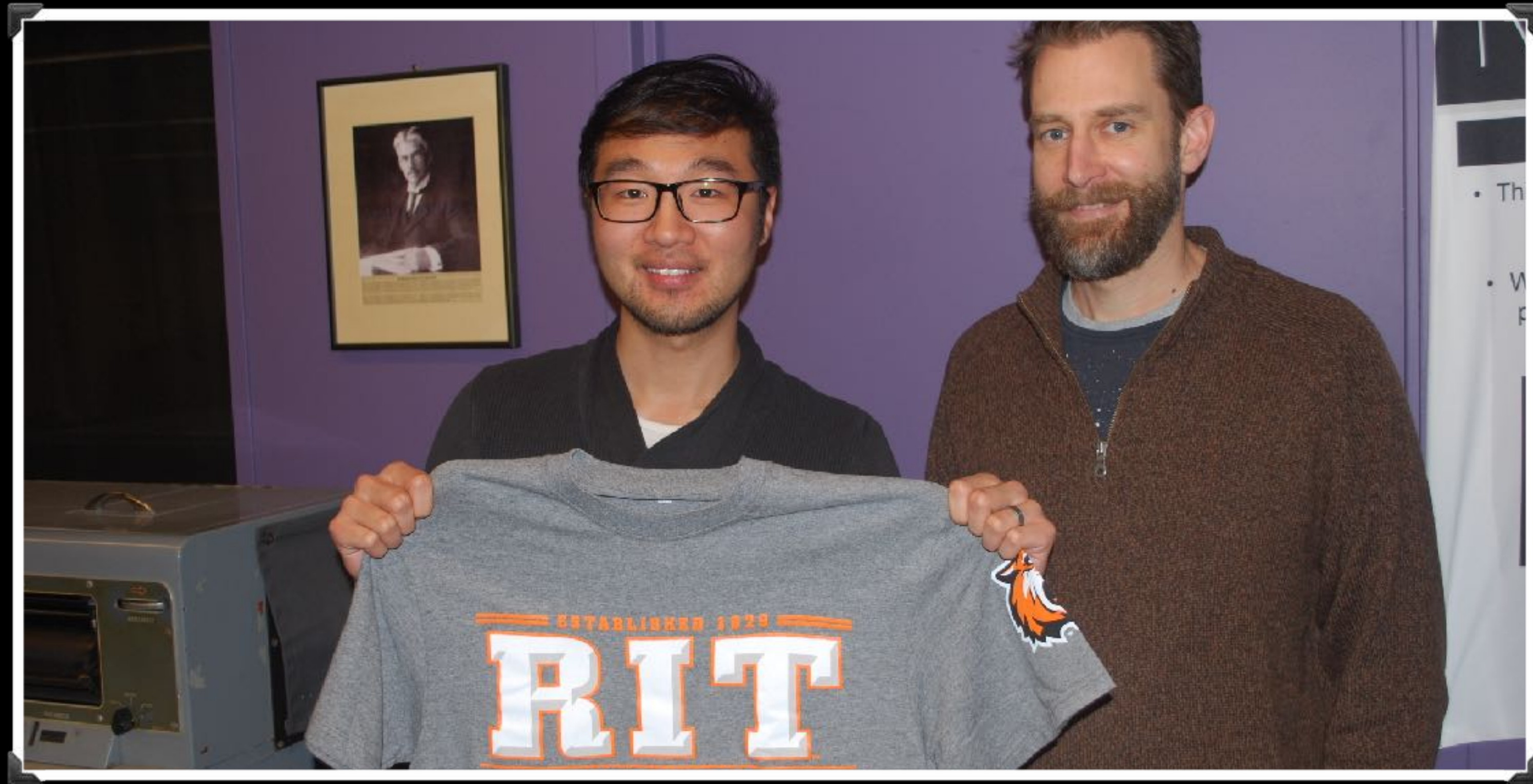
POCS  
MCSL

# Albert Munsell





# Still presides ...



# Dorothy Nickerson



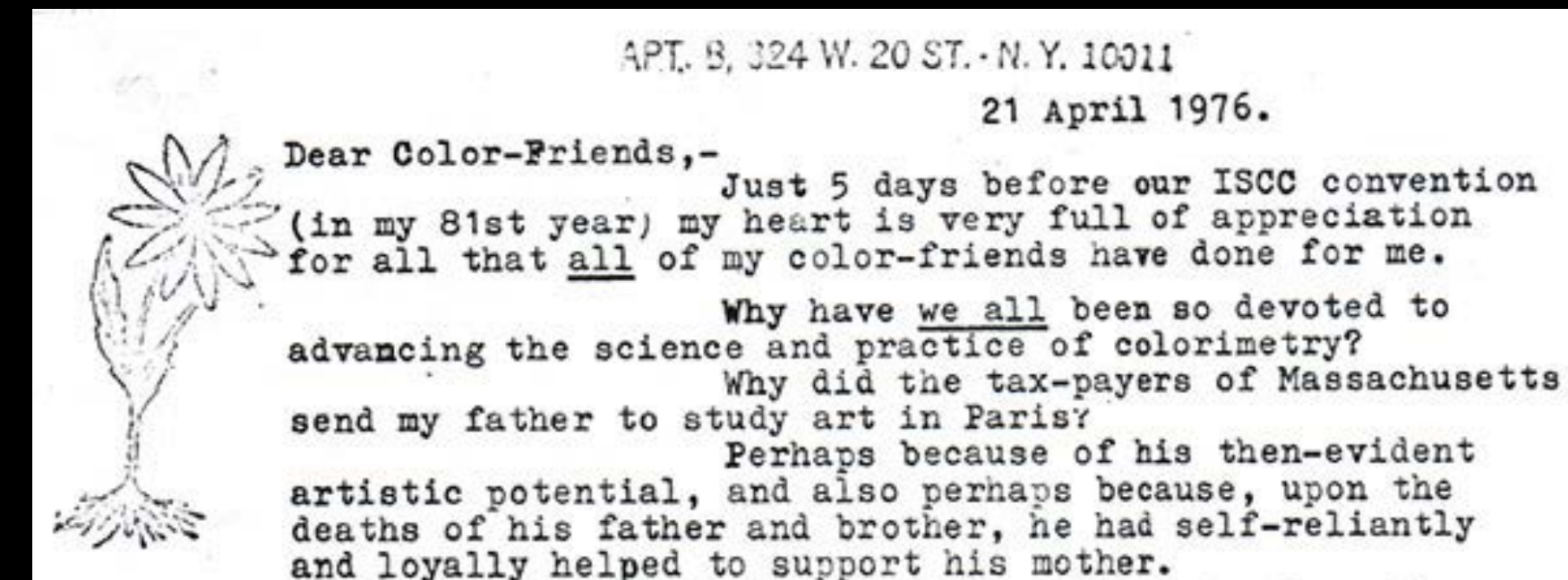
# CR&A (1976)

## *History of the Munsell Color System, Company, and Foundation. III.*

*Reprinted from Color Engineering (1969)*

# Alex Munsell

- Died, Heart Attack, 1983. (87 yo)
- NY Times Headline: “Gave Away Inheritance”
- “the unusual combination of practicing Christian and practicing Marxist”
- Concentrated on scientific aspects of Munsell’s work
- Responsible for 1929 Munsell Book of Color
- Shifted to Social Interests before Foundation’s Creation
- Very Involved in ISCC



# Alex Munsell

<http://munsell.com/color-blog/alexander-ector-orr-munsell/>

Obituary by Dorothy Nickerson

## Inter-Society Color Council Honorary Membership

*Alexander E. O. Munsell*

in recognition of devoted service and contributions to the objectives of the council, is herewith declared an honorary member of the Inter-Society Color Council and is entitled to all the rights and privileges of this membership. By action of the Board of Directors this *9th* day of *April*, 1968

  
Secretary

  
President

# Munsell Color Foundation, Inc.

It was in order to remove any suspicion of commercialization from the Munsell Color Company that Alex Munsell, whose interests after 1929 had turned in other directions, arranged for the establishment of the Munsell Color Foundation, to which the Munsell family turned over their stock and, thereby, the direction of policy of the Munsell Color Company. This was done after an open and well-attended meeting at which many leaders in the color field confirmed the fact that such a move would be welcome and supported. This meeting, held February 25, 1942, in New York City, was chaired by Charles G. Page, legal counsel to the Foundation from that day to this. The National Bureau of Standards and the Inter-Society Color Council each agreed to appoint a Special Trustee to serve on the original Board of Trustees. Other trustees were appointed to represent a wide variety of color interests in the scientific, industrial, and educational fields, one of them by nomination of the Optical Society of America. All served without remuneration.

# Munsell Color Foundation, Inc.

**Guided Munsell Color Company**

**Supported “Academic” Projects & Students**

**Cleveland State University:** Surround Influence on Lightness

**Harvard University:** Color in Art

**Illuminating Eng. Research Institute:** Surface Color Variation with Adaptation

**Library of Congress:** Color in Graphic Arts

**National Bureau of Standards:** Methods of Specifying Color

**Rensselaer Polytechnic Institute:** Step Size in Munsell System

**University of California at Los Angeles:** Dyestuffs in Ancient Textiles

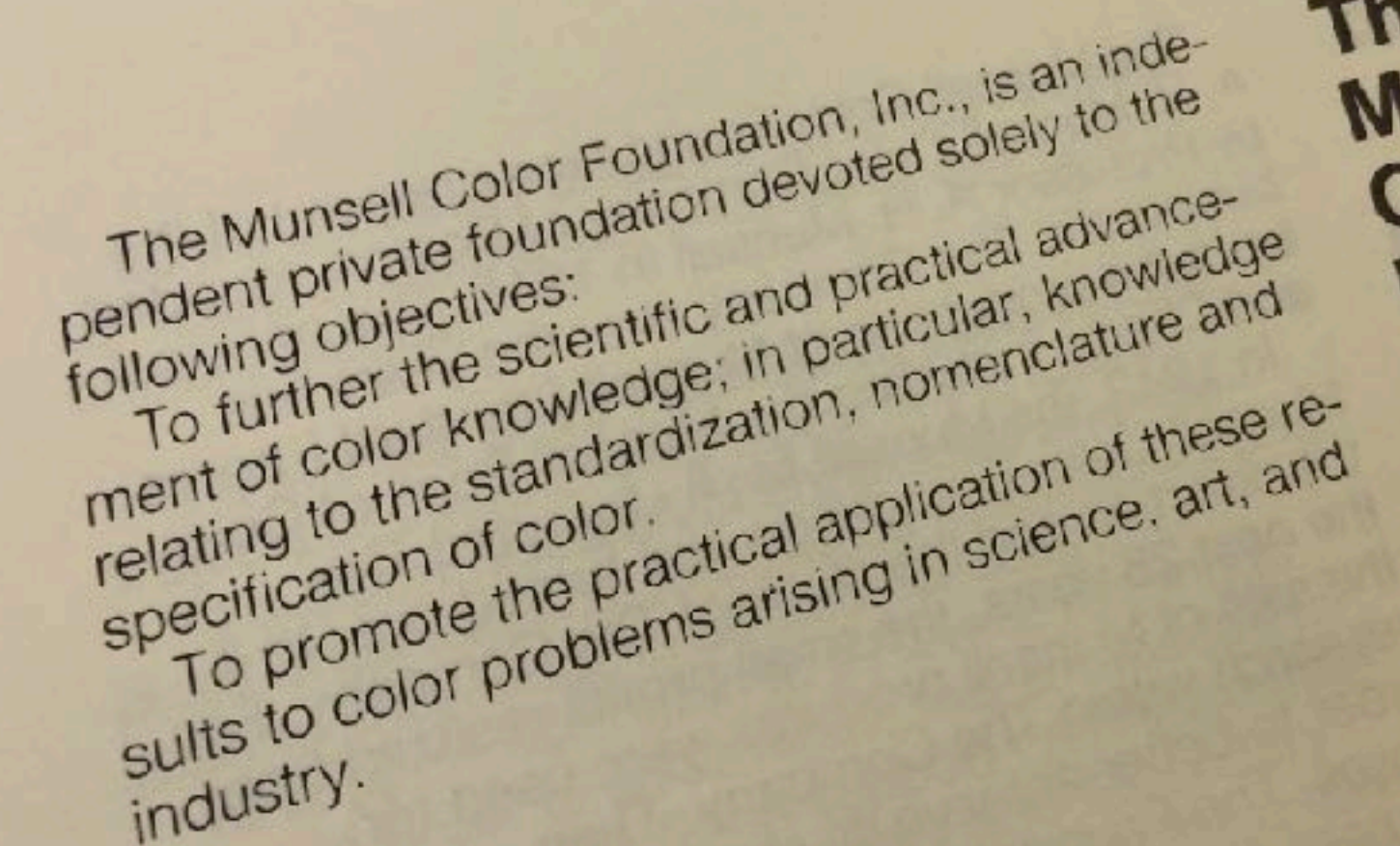
**Dissolved ...**

# Munsell Color Foundation, Inc.

Foundation needed more funds to carry out its work ...



MUNSELL COLOR FOUNDATION  
INCORPORATED



The Munsell Color Foundation, Inc., is an independent private foundation devoted solely to the following objectives:  
To further the scientific and practical advancement of color knowledge; in particular, knowledge relating to the standardization, nomenclature and specification of color.  
To promote the practical application of these results to color problems arising in science, art, and industry.

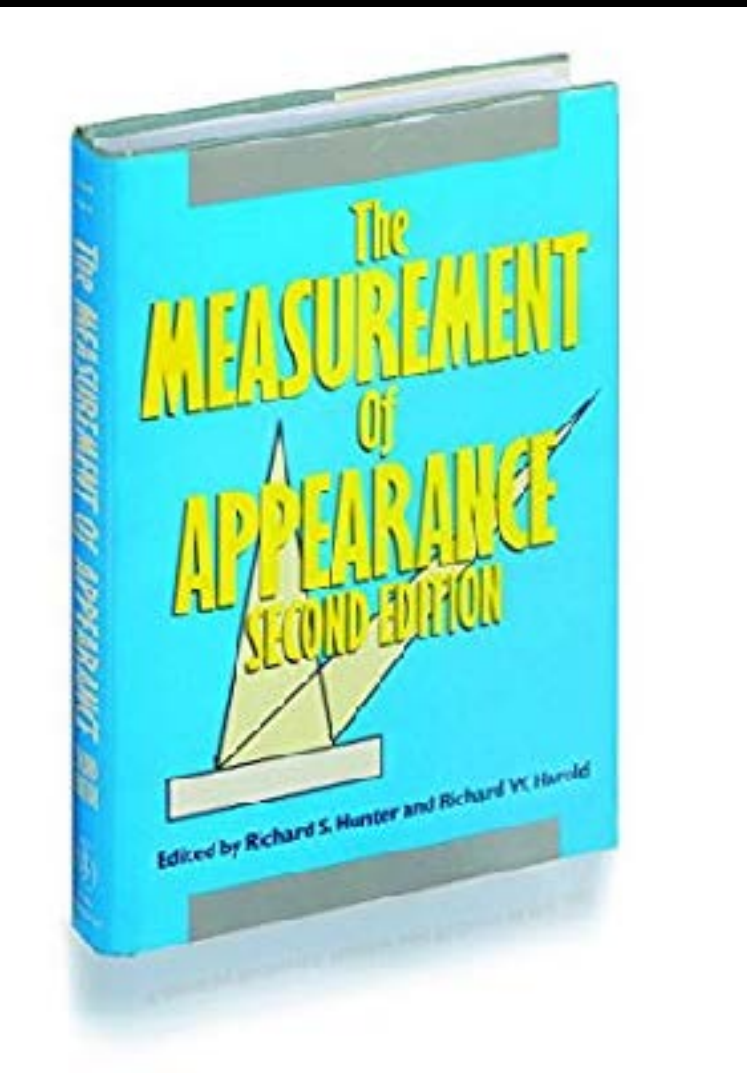
**The  
Munsell  
Color  
Foundation,  
Incorporated**

# Dissolution: Proposals for Endowments

# RIT vs. Berkeley



# Richard & Elizabeth Hunter



**Invented the tristimulus colorimeter**



**Founded HunterLab (Hunter Associates Laboratory)**

**Many accomplishments in color and appearance measurement**

**Established the Richard S. Hunter Professorship in Color Science, Appearance,  
& Technology (*currently held by Prof. Roy S. Berns*)**

# Founding MCSL

***“Nulli Secundus”***

**Kodak Early Retiree, President-Elect of the CIE**

**M.S. in Optics , Ph.D. in Classical Philology**

**Escaped Eastern Europe in WWII (Dressed as a woman!)**

**First MCSL Director**

**First R.S. Hunter Professor of Color Science, Appearance, & Technology**

**Hired Mark & Roy, Published my first paper with him as an undergrad**

**Killed in a motor vehicle accident in late 1985**



*Prof. Franc Grum  
R.S. Hunter Professor of Color Science, Appearance, & Technology  
Director, Munsell Color Science Laboratory*

# Munsell Color Science Laboratory

**1983, Rochester Institute of Technology**

## **Objectives**

- (1) To provide undergraduate and graduate programs in color science, appearance, and technology.
- (2) To carry on research and development in the above named areas of color and appearance.
- (3) To establish a sound standardization program in areas where standards are either void or difficult to obtain from other sources.
- (4) to provide an essential ingredient for the success of the first three — namely, liaison with industry.



# Munsell Color Science Laboratory

## Objectives: Current (Rev. 2002)

- 1) To provide undergraduate and graduate education in color science,
- 2) To carry on applied and fundamental research,
- 3) To facilitate spectral, colorimetric, photometric, spatial, and geometric measurements at the state of the art, and
- 4) To sustain an essential ingredient for the success of the first three — namely, liaison with industry, academia, and government.



# MCSL Faculty



**Franc Grum**

**Roy Berns**

**Mark Fairchild**

**Ethan Montag**

**Garrett Johnson**

**Mitch Rosen**

**Jim Ferwerda**

**Susan Farnand**

**Mike Murdoch**

# MCSL Students



## *Programs & Numbers*

**Color Science M.S. & Ph.D.**

**Imaging Science M.S. & Ph.D.**

**Several Other RIT Undergraduate and Graduate Programs**

**130+ MCSL Alumni**

**From 15+ Countries**

**Working in Industry, Government, & Academia Worldwide**

**About 1000 Publications under MCSL**



# **A few historical research topics ...**

**Chromatic Adaptation Models**

**Color Appearance Models/Dimensions**

**Color Difference Modeling**

**Color Display Characterization/Calibration**

**Color Psychophysics**

**Cultural Heritage Imaging**

**Image Quality**

**High-Dynamic-Range (HDR) Perception & Imaging**

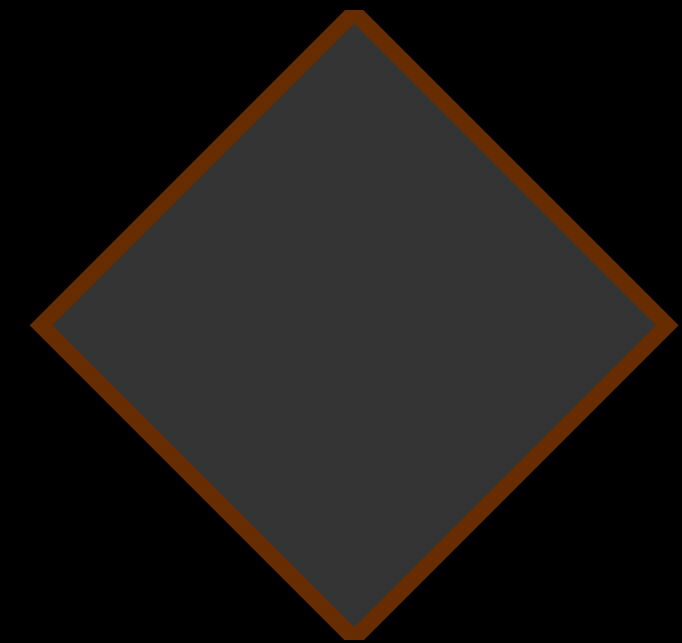
**Measurement Services**

**Spectral Imaging/Reproduction**

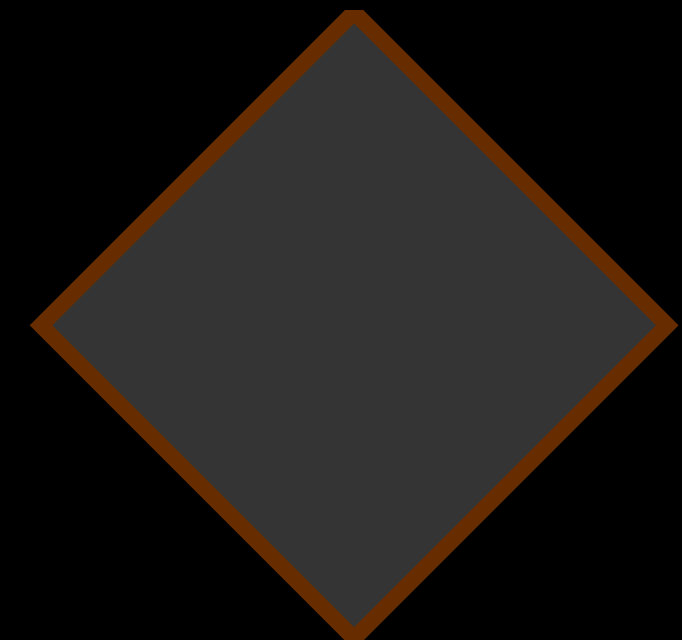
# A Word About Crayons ...



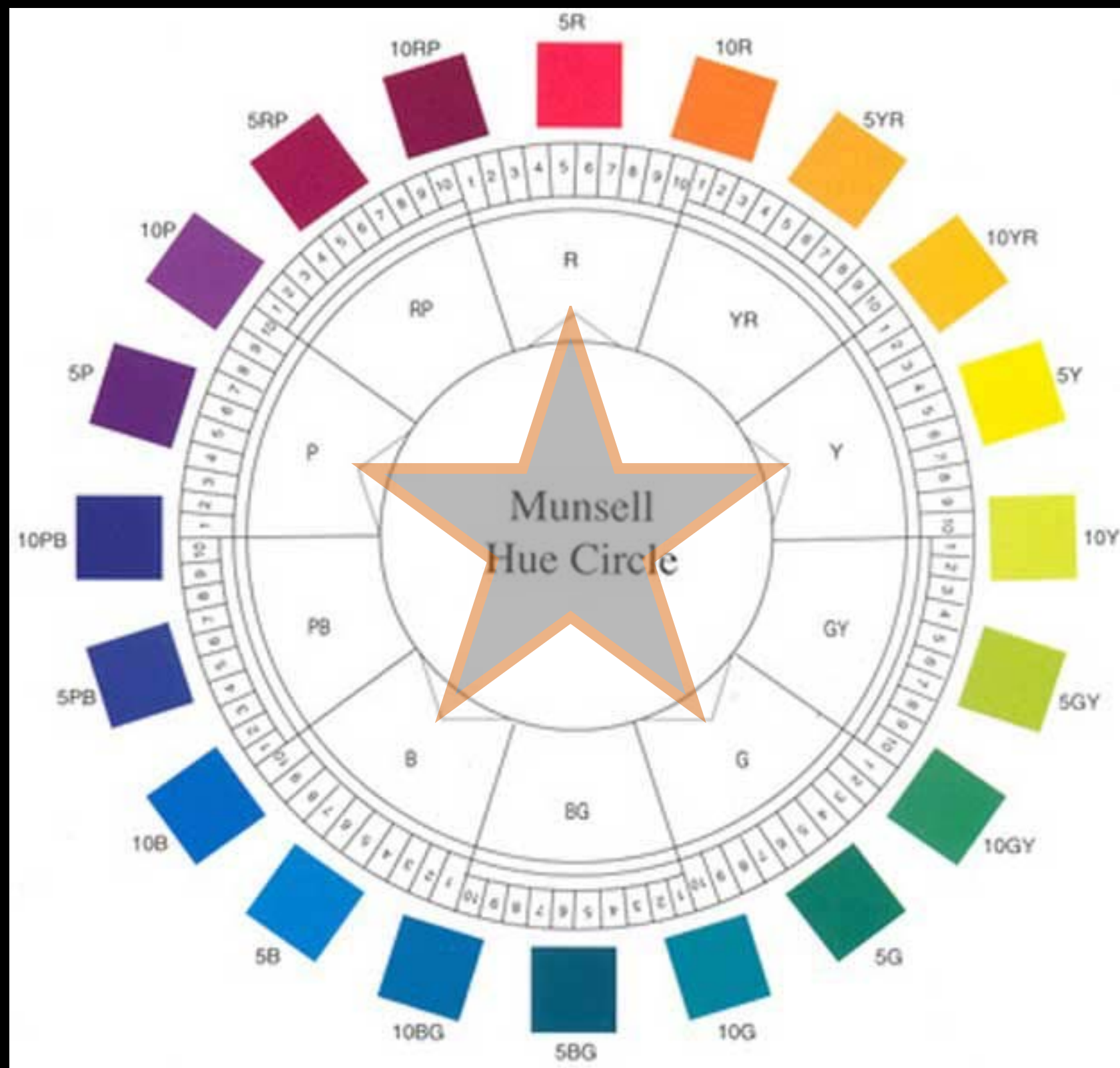
# Another Legacy - 5 Principal Hues



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# Another Legacy - 5 Principal Hues



**Skelton et al., PNAS (2017)  
Hue Categorization**

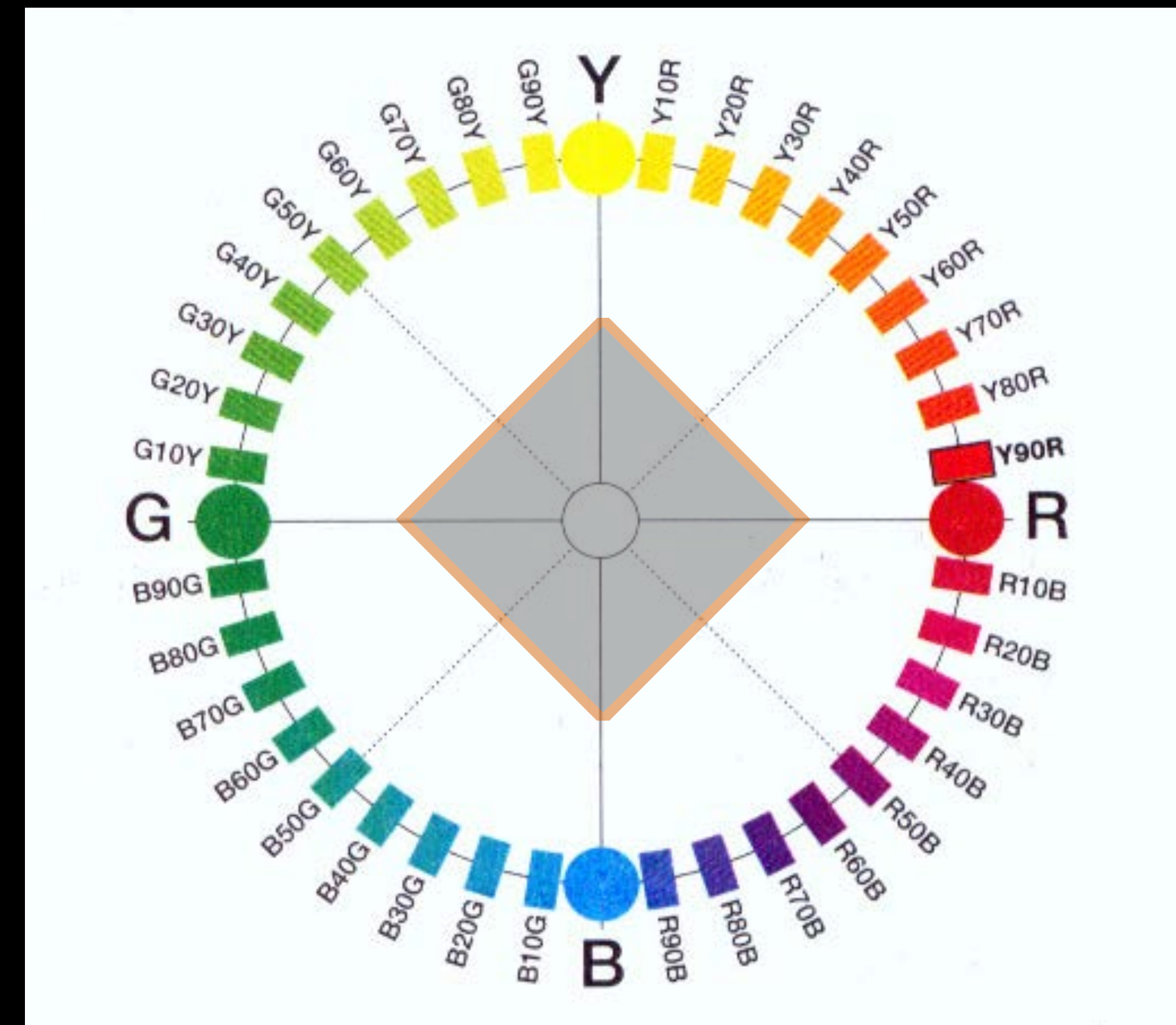
**Infants: R Y G B & P**

**Link to Munsell?**

**JNDs vs. Appearance**

**Research Needed**

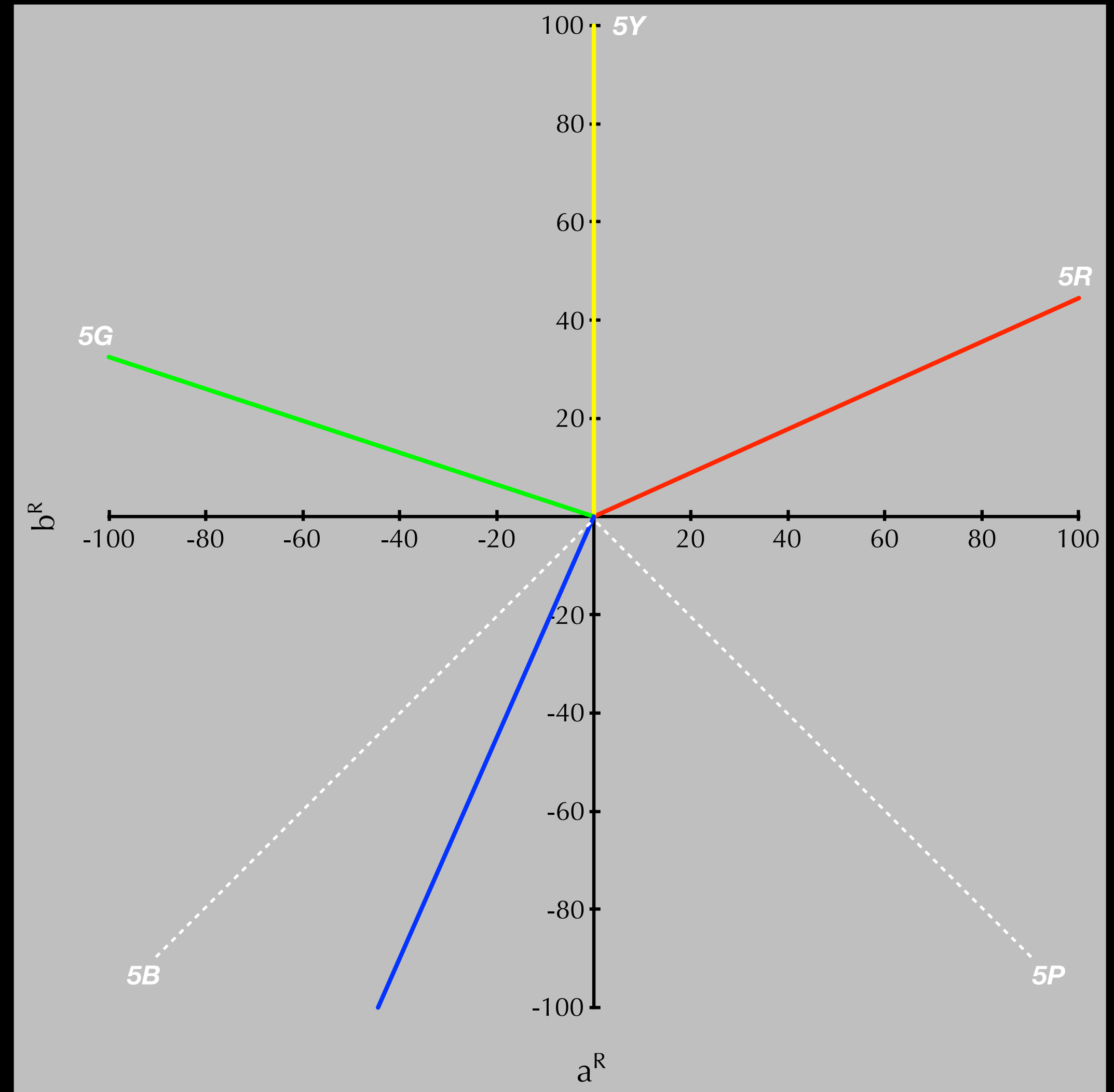
**Anyone want to collaborate?**

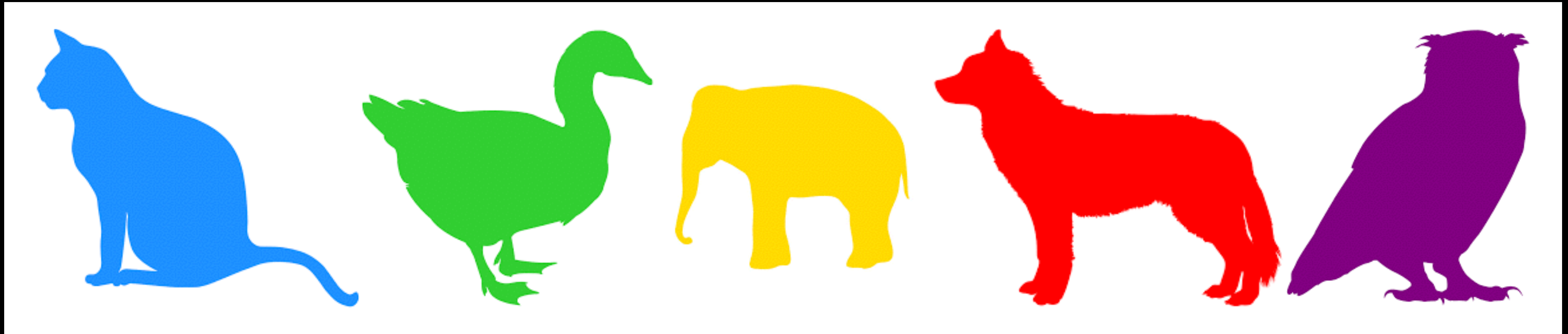


# Principal/Unique Hues

**Munsell :**  
**5 Principal Hues :**  
**Based on Thresholds/Differences**

**NCS :**  
**4 Unique Hues :**  
**Based on Appearance**



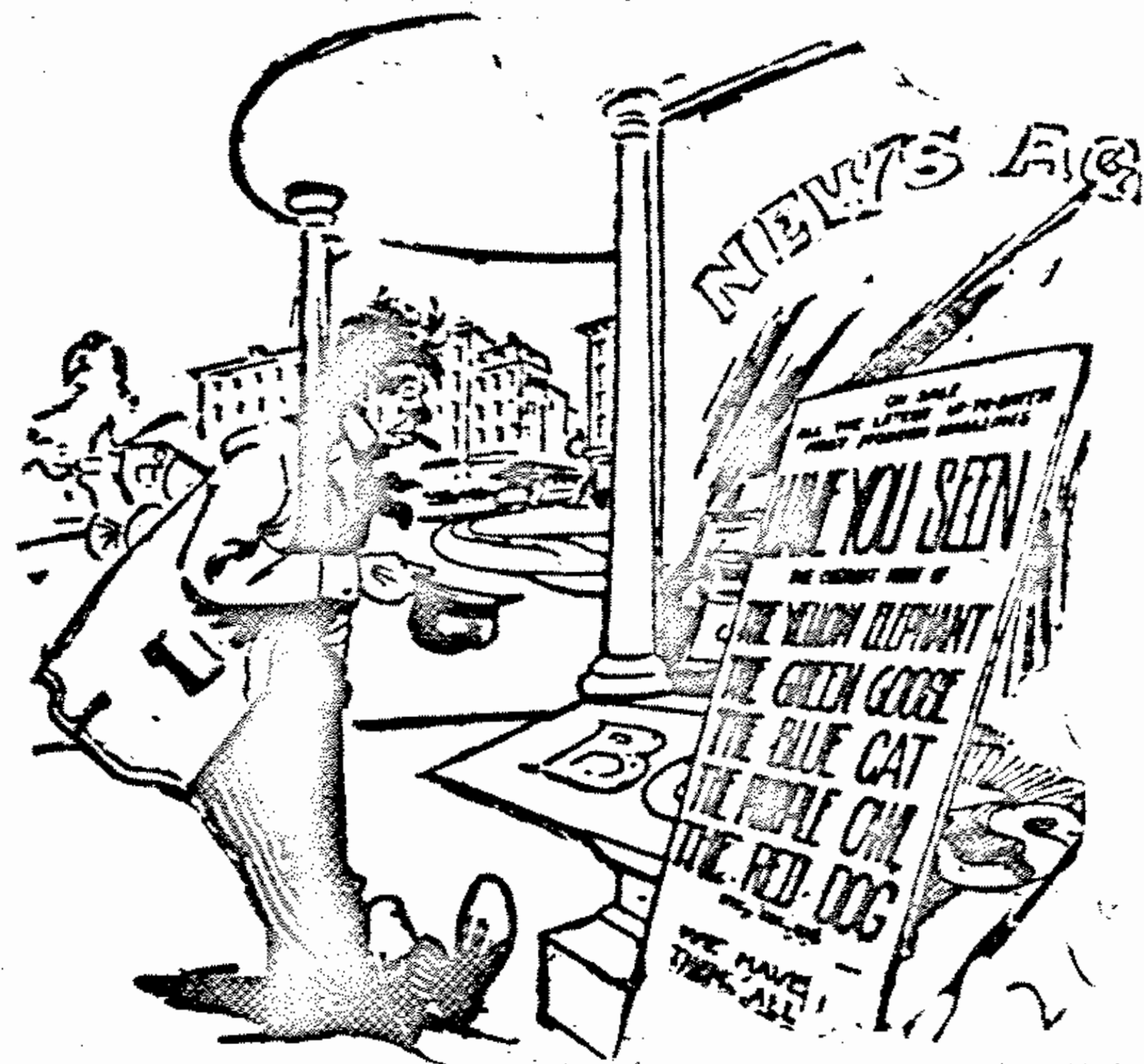


**April 16, 1900 cartoon making fun of magazines ... Munsell sent to Rood.**

**Rood “The fivefold idea seems to be a good one.”**

*Kuehni, 2002*

THOSE UP-TO-DATE MAGAZINES.



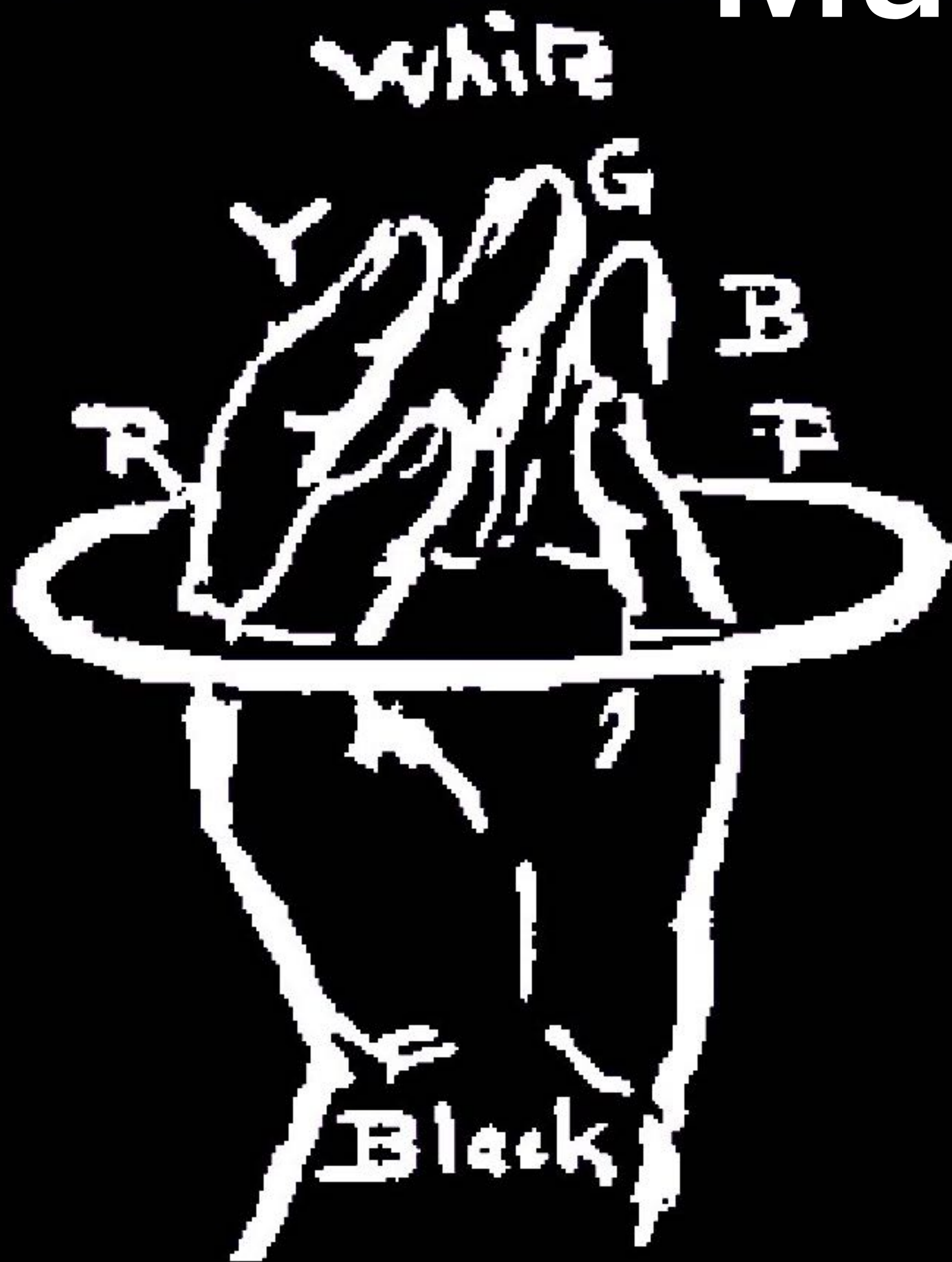
Mr. Booser: I hev sheen 'em all, an' more, too, many a time. Where ish my old companion, th' variegated alligator?

*Apr 16 Prof Rood - plus "the five-fold idea seems to be a good one!"*

16 APRIL, 1900. VOLUME ONE, NOTES OF A H MUNSELL, PAGE 21.

PROFESSOR ROOD REPLIES: "THE FIVE FOLD IDEA SEEMS TO BE A GOOD ONE."

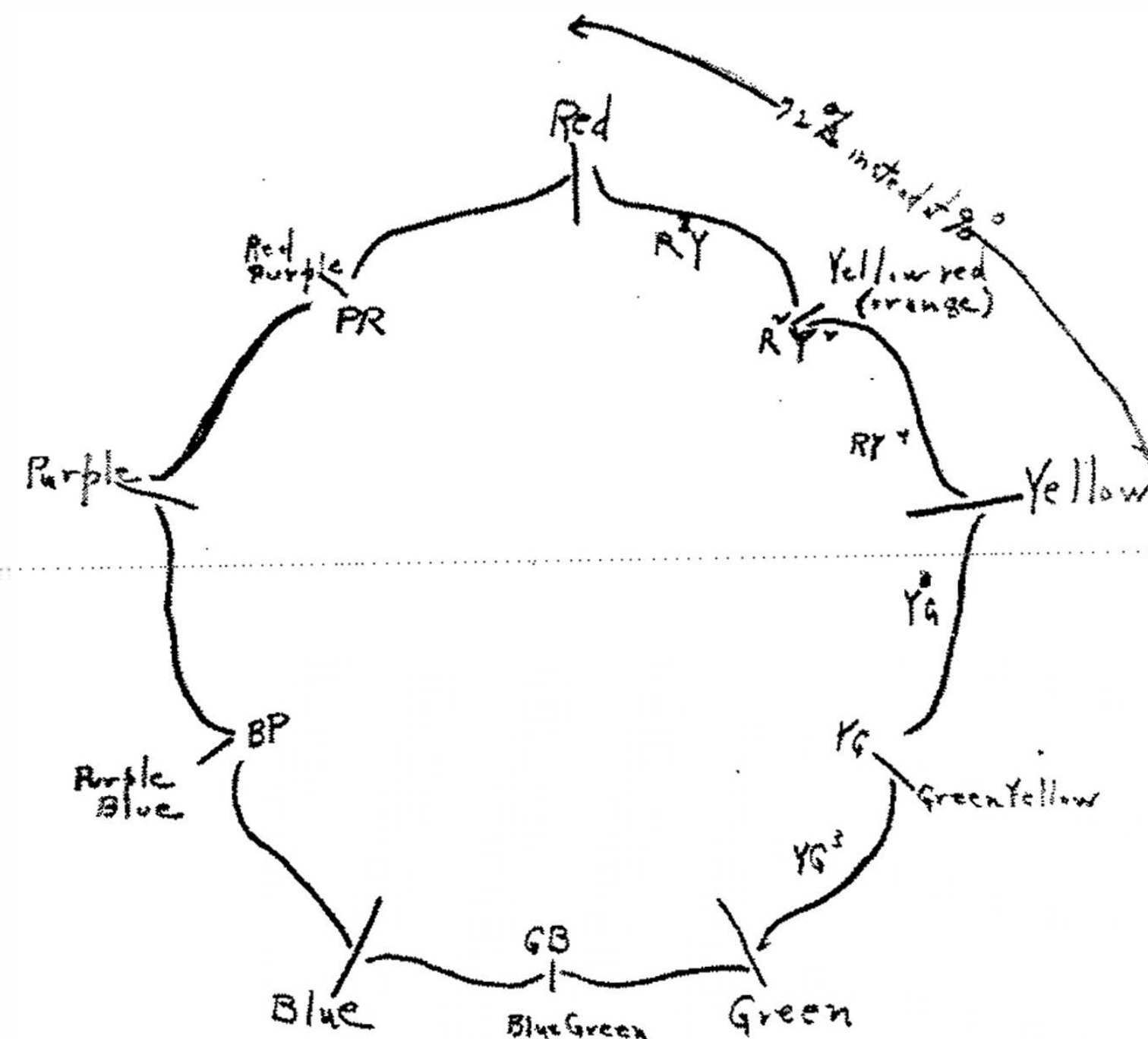
# Munsell's Hand



“A Color Notation”, 1905

April 5

Attempted division by 5  
in order to use decimal  
system 100° from any color  
to its complement -right  
or left-handed  
100° from black to white



Centrals      Intermediates  
1 word      2 words

Red

Purplish red  
Red purple  
Reddish purple

Purple

Bluish purple  
Purple Blue (violet)  
Purplish Blue

Blue

Greenish Blue  
Blue Green  
Bluish Green

Green

Yellowish Green  
Green Yellow  
Greenish Yellow

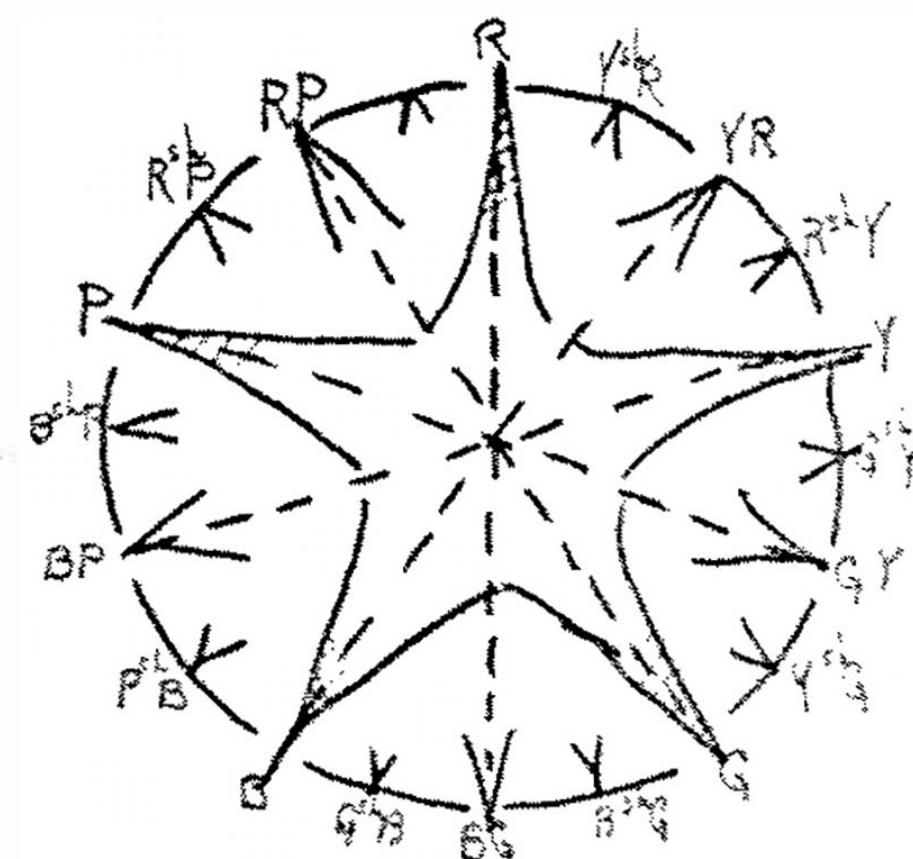
Yellow

Reddish Yellow  
Yellow Red (orange)  
Yellowish Red

A Color Compass  
of  
20 points

(10 to right  
of red  
10 to left  
of red)

Each 10% of  
Hue



“Munsell Diary”, 1900.





WATCH  
STEP

# Another Link to Munsell

The emerging field of psychology helped Munsell to express an idea that had been germinating since he had discovered Chevreul in Paris: that his color work was about sensory perception. Edward Bradford Titchener of Cornell University, who lectured on color using a double-pyramid object of his own design, pushed Munsell away from physics and toward psychology. “Prof T.,” Munsell wrote after one exchange, “says physicist tries to ignore the eye.” The artist-inventor became the adopted son of the psychologists who invited him speak at Harvard University, at Johns Hopkins University, and at the University of Groningen in the Netherlands. He reveled in his newfound academic celebrity, and learned to articulate why the senses were important. In 1893, Louis Prang had written “There is no color outside ourselves.” Munsell put it more succinctly: “Color is in us - not outside.”

“The Color Revolution”, Regina Lee Blaszczyk

*Titchener was my Academic Great, Great, Great, Great, Grandfather.*

*Color is in us— not outside.*

-A. Munsell

**Munsell Color Company 1917 - 1969.**    *(52 years, lives on at X-Rite)*

**Munsell Color Foundation, Inc. 1942 - 1983.**    *(41 years)*

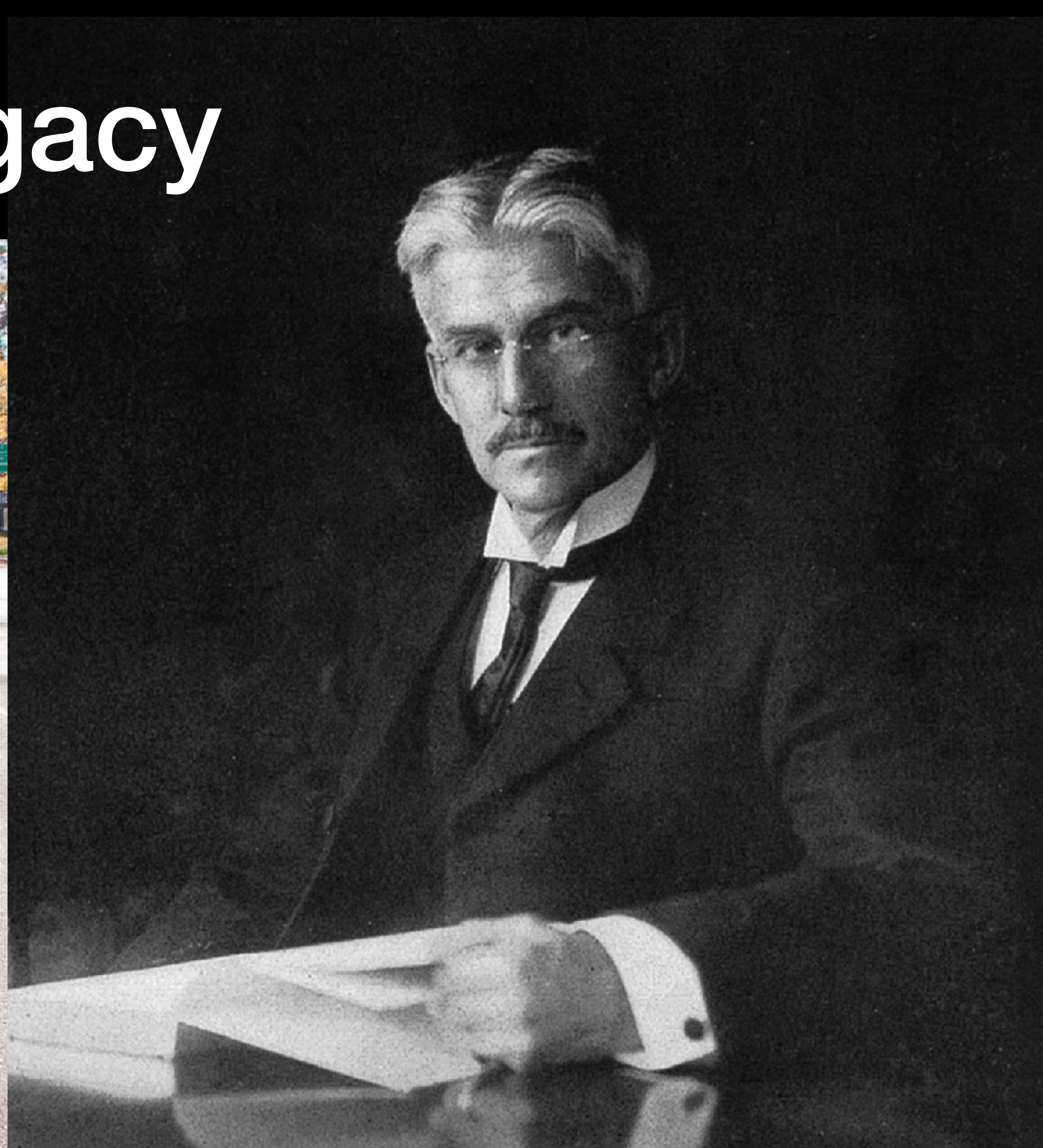
**Munsell Color Science Laboratory 1983 - present.**    *(35 years, so far)*

**Munsell Color Company 1917 - 1969.**    *(52 years, lives on at X-Rite)*

**Munsell Color Foundation, Inc. 1942 - 1983.**    *(41 years)*

**Munsell Color Science Laboratory 1983 - present.**    *(35 years, so far)*

# Legacy





# Thank You

*Questions?  
Comments?  
Proposals?*