From Ochre to Oil: The Journey of Natural Pigments

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5 June 2025 / Artathon / Gaia 1

Introduction

- Surgical assistant
- Project assistant
- Artist

Content presentation

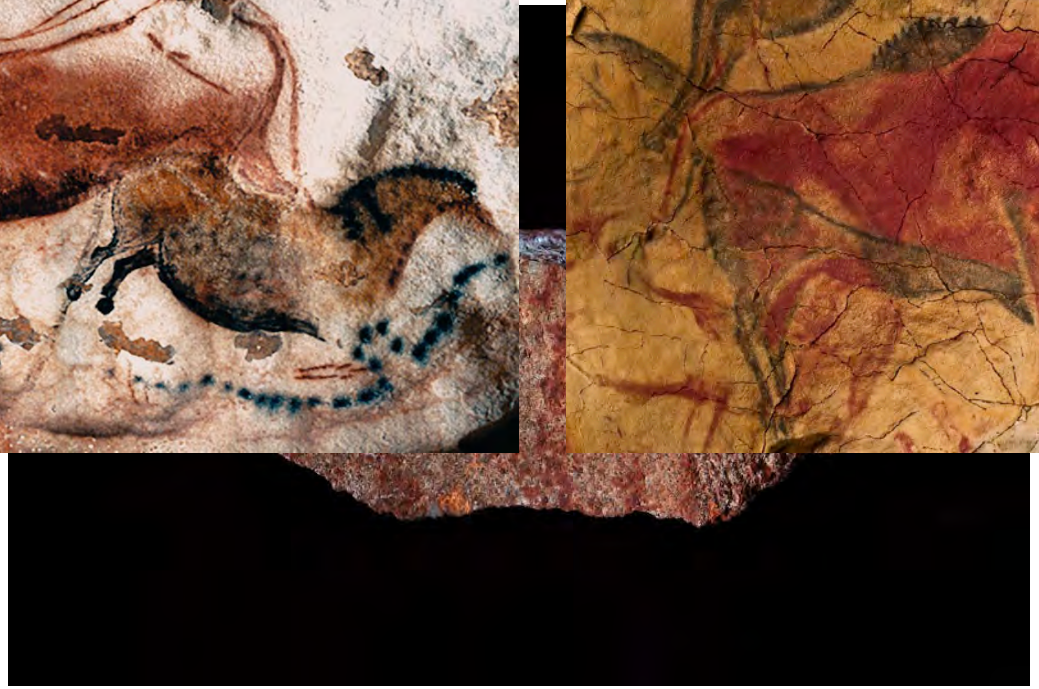
- Timeline of soil pigments
- Advantages / disadvantages soil pigments
- Examples of paintings with soil pigments
- Origin of soil colors
- Other applications

History of Soil Pigments

- Up to ~10,000 BCE: Prehistoric times
- 3000 BCE – 500 CE: Ancient civilizations
- ~500–1600 CE: Middle Ages to Renaissance
- 1600s – 1900s: Modern Era
- 20th Century – Today: Contemporary Use

~10.000 BC : prehistoric times

- Blombos Cave (South Africa)
- Cave Paintings (e.g., Lascaux in France, Altamira in Spain)



3000 BC – 500 AD: ancient civilization

- Egyptians
- Greeks & Romans
- China & India

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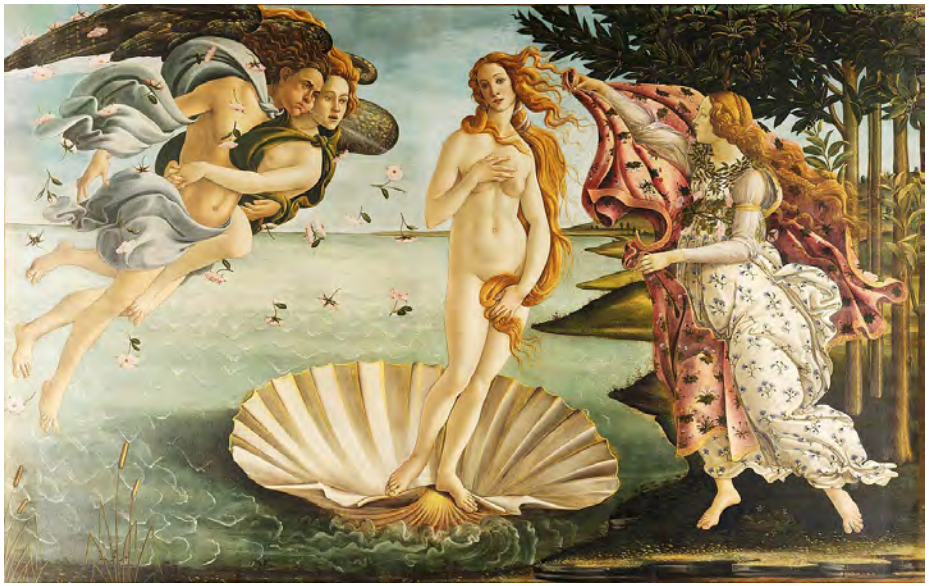
World Soil Information

~500–1600 AD: Middle Ages to Renaissance

- Medieval Manuscripts

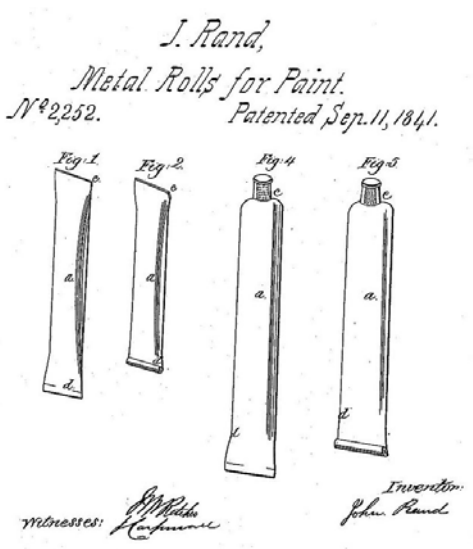
- Renaissance Painters



Classical technique

1600s – 1900s: Modern Era

- **Invention of painting tubes:**
  - Synthetic pigments / invention of painting tubes in 1841
  - Plein air, work more freely



20th Century – Today: Contemporary Use

- Natural Pigments Revival

- Cultural Identity

Why the shift to synthetic paints?

1. Limited color range
2. Variability and inconsistency
3. Cost and accessibility
4. More labour-intensive preparation
5. Lightfastness and durability
6. Industrial revolution / expansion of mass production

Advantages soil pigments

1. Natural and non-toxic
2. Lightfastness (stability)
3. Subtle but rich tones
4. Wide availability and sustainability
5. Compatible with various binders

Examples of famous works in earth pigments

Giotto:

Lamentation

(Scrovegni Chapel, Padua)

Examples of famous works in earth pigments

Leonardo da Vinci: The Last Supper

Examples of famous works in earth pigments

Van Gogh:

Potatoe eaters

(Kröller Möller Museum, Otterlo)

Examples of famous works in earth pigments

Jean-Baptiste-Camille Corot:

Forest of Fontainebleau

(National Gallery of Art, Washington)

Origin of soil pigments

Ochre (Yellow, Red, Brown)

- **Origin**: worldwide
- **Composition**: Naturally occurring clay colored by iron oxide (hematite for red, goethite for yellow).
- **Uses**: paint, cement, asphalt for roads, synthetics and rubbers

Origin of soil pigments

Sienna (Raw and Burnt)

- **Origin**: Siena, Italy, found in many areas with iron-rich soils.
- **Composition**: Clay with iron oxide and manganese oxide.
- **Historical Use**: Widely used in classical and Renaissance art.

Origin of soil pigments

Umber (Raw and Burnt)

- **Origin**: Traditionally from Cyprus, later Italy and France.
- **Composition**: Clay containing iron and manganese oxides.
- **Use**: Underpainting and shadows in oil painting due to its dark tone.

Origin of soil pigments

Terra Rossa (Red Earth)

- **Origin**: Mediterranean regions
- **Composition**: Clay-rich soil with high iron oxide content
- **Use**: historically in frescoes and ceramics

Origin of soil pigments

Green Earth (Terre Verte)

- Origin: Italy, Bohemia, Cyprus.
- Composition: Glauconite or celadonite minerals in clay-rich soils.
- Use: Popular in Medieval and Renaissance art

Non-soil pigments

- Ultramarine : lapis lazuli
- Azurite : copper carbonate mineral (Egyptian paintings)
- Indigo : plant-based dye
- Vermilion : mercury sulfide (toxic)
- Carmine : cochineal beetles
- Lead white : corroding lead in vinegar and horse manure (very toxic)
- Bone black : charring animal bones
- Purple : mixing color
- Gold leaf

Other applications besides paint

- Architecture & Building Materials
- Ritual, Ceremonial & Cosmetic Use
- Pottery and Ceramics
- Writing and Ink
- Textiles
- Scientific and Industrial Applications

Other applications besides paint

Soil Color as an Indicator:

Soil color can reflect the organic matter content, moisture levels, and other factors that influence soil respiration. For example, darker soils often have higher organic matter content, which can indicate a greater capacity for carbon storage and respiration.

Munsell soil color charts:

Munsell Soil Color Charts is a tool that helps people describe soil color in a clear and consistent way. Scientists, archaeologists,

farmers, and geologists use them to compare

and record soil colors when studying the land.

Each hue in soil is a fingerprint of the Earth’s breathing —

red for oxidized life,
gray for the absence of air, and
black for richness born of decay."

— Environmental poet’s paraphrase

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