

Material analysis of inks and pigments in coloured maps

O. Hahn^{1,2}, K. Enzel³, S. Knödel⁴, D. Lange¹, B. van der Linde³, J. Schlüter⁵, P. Zietlow⁵

¹ Centre for the Study of Manuscript Cultures (CSMC), Universität Hamburg, Warburgstraße 26, Hamburg, Germany

² Bundesanstalt für Materialforschung und Prüfung (BAM), Unter den Eichen 44-46, 12203 Berlin, Germany

³ Stiftung Hanseatisches Wirtschaftsarchiv (SHWA), Adolphsplatz 1, 20457 Hamburg, Germany

⁴ Museum am Rothenbaum Kulturen und Künste der Welt (MARKK), Rothenbaumchaussee 64, 20148 Hamburg, Germany

⁵ Museum der Natur Hamburg - Mineralogie, Leibniz-Institut zur Analyse des Biodiversitätswandels (LIB), Grindelallee 48, 20146, Hamburg, Germany

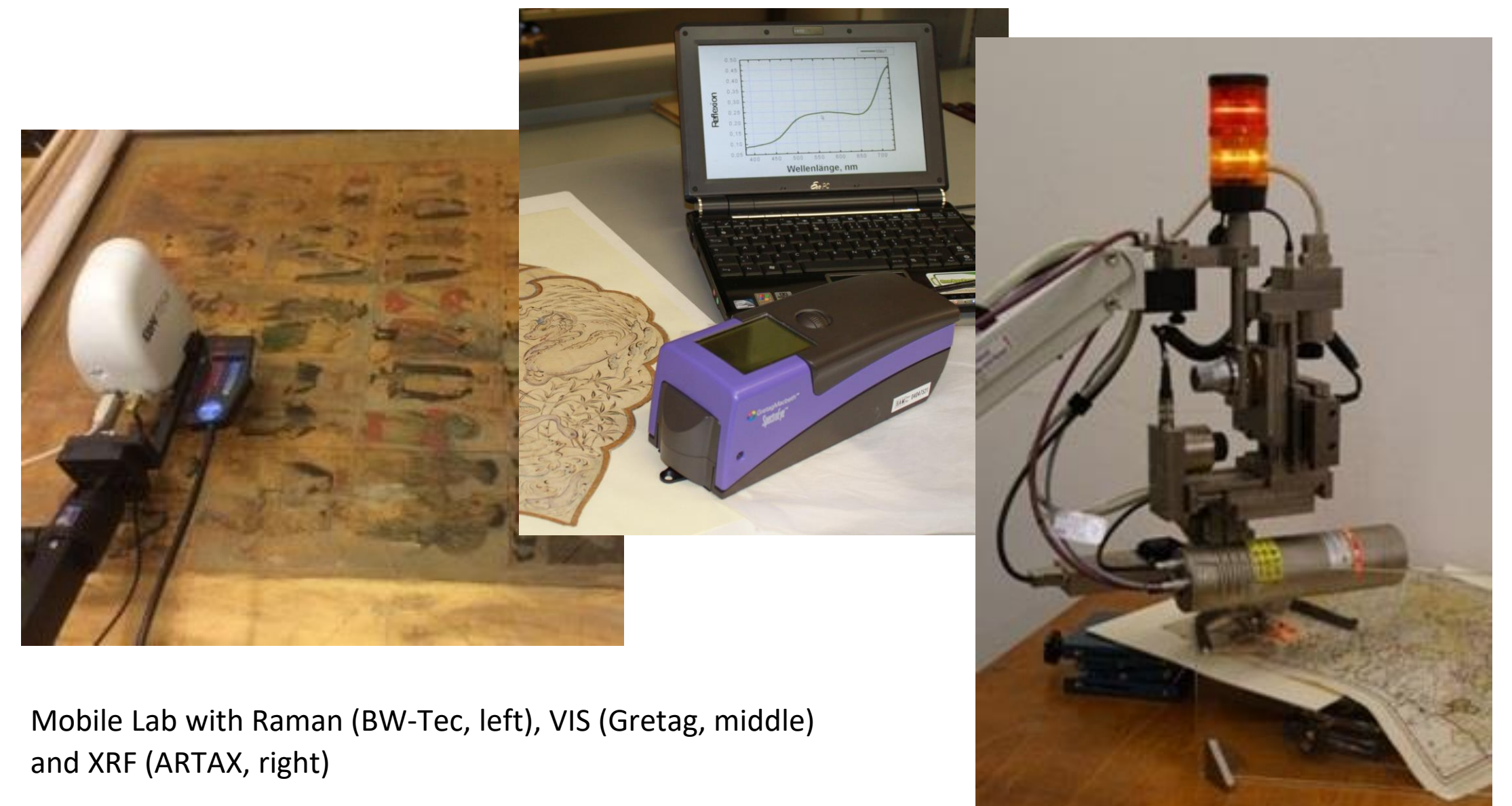
The Project

The 3-year interdisciplinary project *Coloured Maps* (2018–21) was devoted to a systematic study of colouring on maps, focused on a selection of maps from the 15th to 20th centuries from Western and Northern Europe as well as from East Asia (China, Japan, Korea). The maps are located in Hamburg in the *Stiftung Hanseatisches Wirtschaftsarchiv* (SHWA), in the *Commerzbibliothek der Handelskammer* as well as in the MARKK. In cooperation with the LIB and the CSMC, colours, colourants and their use for colouring maps were investigated.

Methods

Scientific analyses were carried out using **non-invasive, mobile** methods. These include **X-ray fluorescence analysis** (XRF) to determine characteristic elements in inorganic pigments, **visible spectroscopy** (VIS) to determine coloured materials, and **vibrational spectroscopy** (e.g. Raman) to analyse organic materials.

The material science findings were compared with corresponding colouring manuals. Cultural studies dealt with colouring practices and the function of colour in maps.



Mobile Lab with Raman (BW-Tec, left), VIS (Gretag, middle) and XRF (ARTAX, right)

Results

In general, it was found that new synthetic colourants and colouring technologies from Europe were swiftly and thoroughly assimilated in East Asia, especially from the 19th century onwards. As regards the colouring of maps, we found only minimal influences from Europe to East Asia, mainly limited to an increase in the full colouring of land masses from the 19th century on. In order to make the transcultural comparison of map colourations possible, suggestions for standardized, specific definitions for the terms ‘colour system’, ‘colour scheme’ and ‘colour code’ were generated out of the project.



Abraham Ortelius, *Germania*, 1575, hand-coloured copperplate engraving
SHWA, Slg. Abendroth, Bd. 10-1, Nr. 001



Hand Atlas, *Yeojido*, Korea, late 18th century, manuscript map by an unknown cartographer
MARKK 82.93:1

Significant colour systems and schemes for different eras and spaces have been worked out for Europe. The colouring of a map can help to **date it**. Material science analyses of the colourants (dyes and pigments) in European maps have confirmed instructions and recipes from corresponding **colouring manuals**, thus confirming **long traditions** of colouring paper objects.

Only **few** written sources on map colouring for the East Asian region exist. Printed maps were coloured **less frequently** in East Asia. Similar to Europe, **significant colouring systems and schemes** could be identified. The material-scientific investigations and the comparison with painting manuals show that the **same colourants** were used for the colouring of maps as well as for paintings.

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