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## **Coloured Hallstatt Textiles. 3000 Years Old Textile and Dyeing Techniques and their Contemporary Application**

The Hallstatt region in Upper Austria is famous for its salt production which started already in the Bronze Age (15<sup>th</sup> century BC). The wealth brought by the salt trade is evident in the grave goods found in the cemetery, which gave its name to an entire phase of prehistoric European culture – the Hallstatt Culture (Early Iron Age, 800-400 BC). Due to the impregnation by the salt, the constant climate in the mine and the protection from light, organic materials such as woollen textiles, leather, fur and wood survived more than 3000 years. Bronze Age and Iron Age textiles feature a wide variety of textures, patterns, seams, hems and colours.

Based on earlier research activities<sup>1, 2</sup> an interdisciplinary team started a three years project on the dyeing techniques of the prehistoric Hallstatt Textiles founded by the Austrian Science Fund FWF – Der Wissenschaftsfonds. Combining natural sciences, archaeology and art sciences the project intended to gain more knowledge about prehistoric dyeing and textile techniques. These scientific results were the prerequisite for the preparation of replicas of Hallstatt-era ribbons and fabrics and for the development of modern textile art and textile design.

Microscopic and chromatographic methods were used to investigate coloured prehistoric Hallstatt Textiles. It can be concluded that dyeing blue with woad was already known in the Bronze Age. In the Hallstatt Culture the blue vat dye from woad was used as well as yellow and red mordant dyes and tannins. The dyers produced certain shades on textiles by combining different dyestuffs and multiple dyeing techniques.

Washing, dyeing, spinning and weaving experiments were performed to succeed in making replicas of multi-coloured ribbons by using authentic materials and to draw conclusions on the prehistoric manufacturing processes. For the first time tablet weaving and band weaving were carried out with very fine hand-spun woollen yarn dyed with natural dyes. Yarn produced of dyed fleece was compared with yarn dyed after having been spun.

At least textile students were inspired by the prehistoric textiles and textile techniques to design modern clothes and textile art.

The intention of the project was to disseminate the results not only to the scientific community, but also to the broader public to raise awareness and improve understanding of the unique cultural heritage of Hallstatt Textiles.

- <sup>1</sup> BICHLER, P., GRÖMER, K., HOFMANN - DE KEIJZER, R., KERN, A., RESCHREITER, H. (Eds.): *Hallstatt Textiles – Technical Analysis, Scientific Investigation and Experiment on Iron Age Textiles*. BAR - British Archaeological Reports, International Series 1351, Oxford, Archaeopress, 2005, 189 pp.
- <sup>2</sup> HOFMANN – DE KEIJZER, R., VAN BOMMEL, M.R., JOOSTEN, I., RESCHREITER, H., GRÖMER, K., MAUTENDORFER, H., HARTL., A., MORELLI, M.: *Ancient textiles – recent knowledge. A multidisciplinary research project on textile fragments from the prehistoric salt mine of Hallstatt*. ICOM-CC 15<sup>th</sup> Triennial Meeting, The Hague 2005, London, James & James, pp. 920-926.

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