

Book Review

A NEW APPROACH TO THE SCIENTIFIC CONSERVATION OF OLD POLYCHROME WOOD

by

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This study proposes an interdisciplinary approach which involves the use of new materials and procedures for old polychrome wood preservation and restoration, by studying the impact of certain active components on the chemical, physical-structural and mechanical characteristics of old local wood elements.

The bibliography used in this study was based on a thorough processing and systematization of numerous recently published reference studies. The references were included at the end of each chapter. The six chapters of the study, which has 282 pages, focused on various topics, from aspect concerning the analysis of the old polychrome wood state of conservation, to a series of experiments in different research directions:

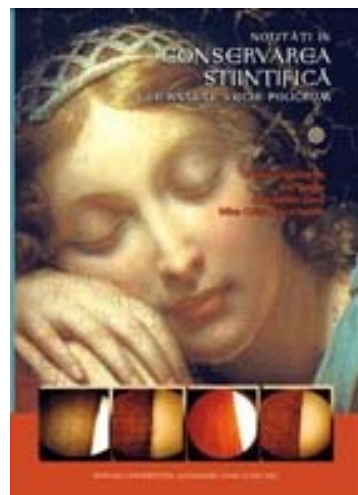
- Establishing the *complementary relationships (corroboration and coassistance)* and the *interdisciplinary relationships* between various *analysis techniques* in order to set up an experimental protocol involving the study of the *chemical nature, the physical structure* and certain *mechanical characteristics* of components in the structure of old polychrome wood so as to establish its state of conservation and also to find new materials and procedures for an active preservation and restoration with compatible intervention techniques;

- Establishing the foundation for issues regarding the normal variation domain of the hydric equilibrium and devising a method, with relevant technical aids, to determine it and the methodology to apply it in various experiments, such as: finding the archaeometric characteristic and the evaluation of the impact of the active preservation treatment on the conservation of wood;

- Studies regarding the effect in time of certain active preservation treatments of old polychrome wood;

Thus, in chapter I they present the structure of polychrome wood, a painting on wood, followed by a presentation of the most frequently encountered conservation states, especially for orthodox iconography. Moreover, in the same chapter, they approach the factors and the processes of destruction and alteration, that is, the deterioration and decay of paintings on wood, as well as the influence of other materials (such as metal) on the conservation of old wood in works of art.

Chapter II focuses on the description of materials, processes and the operations involved in the preservation and



restoration of polychrome wood, with special attention to the main modern systems with multiple insecto-fungic, fireproof and water-repellent action for old wood (substances containing boron, synthesis pyrethroids, organic phosphoric compounds, natural organic products).

Chapter III presents the main types of wood that have polychrome structure, especially the types which were used in the past. Then it presents the way to take and prepare samples for analysis, their origin, state of conservation and the dendro-chronological characteristics thereof. Moreover, they describe the methods and techniques involved in the analysis of wood and of polychromes, in the study of the impact of active preservation treatments of old wood in works of art and the analysis of solvents and the active principles used in active preservation and restoration recipes. The authors used modern micro-destructive and non-invasive scientific investigation techniques, involving co-assistance and corroboration systems, such as: optical reflexion and transmission microscopy (MO), with dynamic or static digital processing, electronic scanning microscopy (SEM), together with an electronic dispersion x-ray micro-probe (EDX), IR spectroscopy, FT-IR or micro FT-IR, optical microscopy in cross-sections together with staining tests and others.

Chapter IV focuses on the analysis of the dendrologic, archaeometric, chemical and physical-structural characteristics of certain representative wood samples with polychrome structure from heritage items, together with a series of characteristics of the paint layer, both being involved in the analysis of the conservation state of the two components (support and polychromy).

Chapter V approaches new materials by using organic systems based on red Câmpești petrol, propolis and tannin and active preservation procedures for polychrome wood artifacts.

Chapter VI comprises studies regarding the evaluation of the impact of active preservation and restoration of natural and polychrome wood with certain active principles.

This work is highly original and represents an important contribution in the field of research on new materials and procedures used in heritage items polychrome wood treatment, in order to stop the evolution of deterioration and decay. It is worth mentioning some of the original elements in this study: obtaining organic ecologic solutions for the treatment of polychrome wood, which were patented by three procedures; then the substantiation, for the first time in an experiment, of the term normal variation of the hydric equilibrium of wood and the elaboration of a method to determine it (also patented), with multiple practical applications, such as: emphasizing the characteristics modified under the influence of preservation treatments of old wood in works of art. By studying the processes of hydration - dehydration, using the system of correlation of the reversible hygroscopic water absorption - desorption curves and mathematically processing them by order I and II derivation, they determined the impact of various preservation and restoration treatments on wood and to establish certain archaeometric characteristics among which: *the critical correlation time, the average correlation humidity and the maximum absorption humidity*.

In fact, the authors employed a simple experimental protocol, by using systems of coassistance and corroboration between a series of modern scientific methods and techniques, such as: micro-FT-IR, SEM-EDX, optical cross-sections microscopy, together with staining tests and others, which enabled them to measure the penetration degree of the active principles used in preservation treatments and the conservation ability of the structural components of treated wood; the evaluation of the physical-structural modification (variations in size as dilation and contraction, density and porosity) of wood samples (lime wood, poplar wood) after treatment with disperse systems (red petrol and propolis alcoholic solution).

This work is primarily aimed at master and doctoral students specializing in the conservation of cultural and natural heritage items, but also at specialists and individuals collaborating with The Ministry of Culture, The Ministry of Environment and Durable Development, The Ministry of Transport, Construction and Tourism and at the owners of monuments and other works of art containing wood.

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