The present work is divided in two parts. Part 1 concentrates on the study of the manufacture of copper plates used as a support for oil paintings since to date, there has not been a great deal of information available. The research involved comparing the information gathered from historical treatises on metallurgy and recent studies of paintings on copper and copper archaeometallurgy, with results from a set of thorough scientific analyses undertaken on the copper supports of fifteen European paintings (dating from the 17th and 18th centuries). This comparison revealed interesting insights into the metallurgic processes used to produce the copper ingot from native copper, and the subsequent manufacturing processes undertaken to obtain the copper plates.

Copper ore purification was a complex and expensive process. Purification included several steps, all of which were rigorously executed as attested by the high level of purity of the copper produced.

Scientific analyses undertaken on the copper supports of the fifteen European paintings revealed that the manufacture of the plates from the ingots involved cycles of cold working alternating with annealing. Hammering took place which would have been aimed to form a plate with adequate hardness, while the intermediate stage of annealing returned malleability so that further intense cold work, necessary to achieve a plate without breaking, could be carried out. Part 2 focus on the characterization of two wax-resins formulations used as infill materials for oil paintings: a formula used by Carlyle in the early 1980s (C-PWR) and Gamblin pigmented wax-resin (G-PWR). and, based on the negative impact on copper of the acidic beeswax in both formulations, an exploration to find a new formulation with a neutral acid value was carried out. Preliminary trials and testing focussed on the development of a new wax-resin formulation suitable for infills on oil paintings with a copper substrate. New options for infill materials on copper supports are particularly important as the range of infill materials currently available are not suitable, for a variety of reasons, for use on this type of support. Although ageing tests are still needed, the characterization of the individual materials, and of the new formulation, KTW5-R1, made of Techniwax 9426 microcrystalline wax with Regalrez 1094, showed that this wax resin mixture with an acid number of 0, is likely to be inert in relation to the copper and chemically stable since it is composed of saturated hydrocarbons only.
The use of oil painting mediums is really a matter of taste and not a requirement. Many artists do not use any mediums at all other than a bit of oil to make the paint more workable, as some paints are quite thick straight from the tube. Other artists swear by certain mediums. Sun thickened linseed oil is a thick bodied medium that is produced using the heat of the sun. An equal amount of both linseed oil and water are mixed together in a container and left in sunlight for several weeks or longer. Metals like copper and aluminum are sometimes used as a painting support. Obviously metals are quite heavy, so paintings on this type of support are usually on the smaller side.