

Material Values in Art & Design.

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Foreword

In writing this book my aim was the provision of what I hoped would prove to be of interest and value to anyone engaged in art, the crafts or, indeed, any activity where it is relevant to know why we use certain materials, when and how they were first discovered, their cultural and economic significance, the methods invented for processing and fabricating materials, and not least the values we place on them.

There are, however, certain intentional omissions. I have not, for example, included substances and materials that are largely exclusive to purposes outside the fields of art and design, nor have I included any detailed examination of materials that have been introduced within the past fifty years.

A Materials Hierarchy.

Finances permitting, most people living in past centuries would probably have invested their savings in a quantity of gold, especially in the event of a need to escape an aggressor or on occasions of civil unrest or invasion by a foreign force. Precious metals in the form of coinage provided the most easily transferable and flexible way of preserving personal wealth. There were occasions when an individual might have had a quantity of coins that exceeded or more usually failed to meet their immediate needs, a situation which might have led to what was known as clipping. With recourse to this fraudulent practice it was possible to file or cut the edges of coins in order to create a sufficient quantity of metal for conversion into gold or silver plate. Indeed, coins have survived from the late medieval period clipped to an extent that their original circular shape has been irretrievably lost. So widespread was clipping that many people would have carried with them a small set of scales, along with the necessary weights, in a pocket-sized wooden or metal box, thus enabling them to determine the metal value of the coins they were being offered. Needless to say coin clipping was considered a serious offence to the extent that anyone found guilty of carrying out the practice would have, as late as the seventeenth century, been charged with treason punishable with the death penalty. The introduction of milled edged coins and what were called promissory notes, followed by paper money, were largely an assurance against being victim to these fraudulent practices.

Gold coins were obviously of greater value than coins of silver with a similar relationship of silver to copper. This hierarchical order of values was reflected in materials other than metals. For example, mahogany had a greater market value than many other woods such as pine, differences that were largely determined by a combination of transport costs and demand. In eighteenth century Europe most countries had easy access to abundant sources of pine while obtaining mahogany involved the expensive importation of supplies from distant lands. At a period when sailing ships were transporting mahogany and other exotic timbers over vast distances, with all their attendant dangers, such factors were instrumental in determining market values. Therefore, aesthetic values apart, the use of mahogany fronts to drawers with soft wood carcasses was a practice largely determined by economic considerations. Similarly, the introduction of veneering by which a board of a more costly timber was separated by sawing into thinner sheets and glued to a base of a cheaper wood was in part a practice with its origins in cost.

Some materials have gone out of use because they have either been replaced by alternatives with superior properties or supplies have become exhausted. Then there are other instances when in the interests of conservation manufacturers and craftsmen have been prevented by law from exploiting certain materials. In comparatively recent times the use of elephant ivory has been banned or strictly regulated because ivory was being consumed in great quantities, especially during the nineteenth century, for purposes ranging from oriental carvings to, in the west, piano and organ keys. With the growth of tourism to such countries as Africa during the last century the demand for ivory souvenirs

reached a point that posed a serious threat to the continent's elephant populations. Fortunately, a replacement for ivory has appeared during the past fifty years in the form of acrylic resins which can be made to simulate the colour and texture of the genuine material. Such is the effectiveness of these compositions that distinguishing between say an authentic Japanese netsuke in ivory and an equivalent piece made in resin can prove problematic because the best acrylic resins have succeeded in replicating the colour and even the texture of genuine ivory, and offer the added advantage of their suitability for casting in moulds.

Synthetic substitutes have emerged for a host of materials from animal skins to precious stones. Imitation leather is available of a quality that requires careful examination in

distinguishing it from genuine hide. There are, however, some materials that have supposed chemical properties which cannot be created in a synthetic substitute. Familiar are the reports of poachers who have hunted endangered species for some relatively minor part of the animal's anatomy. For example, rhinoceros have been killed for their horn either to satisfy the whim of a Middle Eastern potentate for an exotic sword or dagger handle or to rejuvenate, when ground to a powder, the libido of someone with a sense of ill informed optimism. Tiger bones are sought in China for similar purposes.

Some materials in the past were accorded a status that has been overtaken by later inventions and devices. An interesting example of this kind of change in status is the importance that was once attached to salt. During the medieval period salt was valued beyond being merely a condiment when it was recognized that it had meat- preserving properties. The shelf life of meat, prior to the introduction of refrigeration, was measurable in days. The ensuing high value attached to salt is evidenced in the existence of silver and silver gilt standing salts that, during the medieval period, would have had a premier place on the baronial high table; hence the expression sitting above or below the salt.

Herbs and other perfumed preparations were similarly effective in situations where there were offensive smells as a barrier between the offending matter and one's nose. As late as the mid nineteenth century Britain's cities, with their poor drainage facilities and open sewers, were a major source of several serious diseases. It was widely believed that these bad smells alone were a source of infection. What were identified as miasmas were blamed for the high incidence of scarlet fever and respiratory infections that plagued all levels of society. It was to the credit of such men as Edwin Chadwick and the ceramic manufacturers John and Henry Doulton that conditions in our cities began to improve with the latter's promotion of water filters, and efficiently designed sewer systems.

It is probably obvious from what has already been said that depending on requirements some materials are valued for their rarity, aesthetic qualities, perceived medicinal properties, whether real or imagined, while others possess an importance because of their utilitarian characteristics. The idea that we can draw up a hierarchy of materials based on their preciousness or practical value in single table or list is therefore fundamentally flawed. The only way to proceed is if we draw a clear distinction between intrinsic values, largely based upon rarity, and utilitarian values which in certain cases may have great importance for our very survival.

In compiling a materials hierarchy due consideration should be given to their sources, the distance of this source from the points of use, abundance or otherwise of a given material, ease of cultivation or extraction, a material's characteristics or properties, its resistance to destruction or decay, and last but not least its suitability for working by hand processes or mechanical methods.

Where we place a material in any hierarchy is often in inverse proportion to its practical usefulness. It is important to mention that the point at which a material appears in our proposed table may change as a result of the discovery that it possesses some property previously unrecognized. Hence it follows that a hierarchical table devised say a hundred years ago may not be acceptable today. In the case of gold its high value has been maintained for many centuries long before the discovery that it promised major benefits for medical science. Uranium, on the other hand, was merely a mineral used in glass and glazes long before its enormous destructive potential was recognized. There are other minerals that, because of their abundance, continue to occupy a lowly position in the materials' table. Take clay as an obvious example. There are few places on earth where a clay of one kind or another is totally absent and it has accordingly played a fundamental role in many areas of life. Indeed, of all the materials discussed in this book its antiquity in the form of ceramic artefacts is second only to flint. Its applications range from bricks and simple pots to items

essential to space exploration yet until the Renaissance, and with certain exceptions, potters had rarely enjoyed a high standing in the context of other occupations. Conversely, the art of the silversmith was based on a metal that was at certain periods and in some cultures more highly valued than gold therefore in keeping with the preciousness of their essential material silversmiths enjoyed an admired status. However, because clay is a common material which sticks to one's shoes and may hinder agriculture putting it to good use was an appealing activity. Some potters, despite the lowly standing of most of their fellow craftsmen in the medium, achieved success and not least access to the highest levels of the market by making wares of good quality often inspired by forms in gold and silver.

There exists a category of earthenware from fifteenth and sixteenth century Italy characterized by a white glaze and painted in a palette of bright colours and which is known by the name maiolica. Italian maiolica represents one of the rare occasions when potters achieved the status of artists at a time when their less able contemporaries in, for example, Britain were not considered of sufficient importance to warrant membership of a trade's guild. A maiolica potter having risen to the level where he was valued as being equal to a painter or sculptor would obviously have wished to maintain his elevated position. Part of this success might have been attributable to his discovery of some new glaze or technique which he would have wanted to protect from imitation by his competitors. For example, a potter named Giorgio Andreoli of the Italian town of Deruta perfected a glaze known as lustre, the original discovery of which lay at a much earlier period in the Near East. Andreoli's success was in large part due to his ware's similarity to precious metals. Although a version of what later became the patents system existed in late medieval Italy, because Andreoli did not actually invent lustre his particular version of the technique did not presumably qualify for protection.* Some trades and crafts took unusual steps to protect and maintain their claimed monopoly, in other words they sought and obtained legal protection from infringement by imitators.

In 1292, it was decreed that all glass houses in Venice would be transferred to the islands of Murano. Although the authorities of the time were influenced in introducing this move because of the threat of fire, resulting from the proximity of Venice's glass houses to other properties, it was also initiated as a measure for bringing the glass-making community together in the interests of trade secrecy. Secrecy was further maintained with recourse to a system which is best described as an approved marriage. In other words members of the leading glass-making families intermarried in order to consolidate skills and practices. Severe penalties were imposed on anyone judged guilty of betraying a family's trade secrets because Venetian glass making in the sixteenth century had reached unprecedented levels. By this date the region's glassmakers were producing an almost clear metal, examples of which have survived decorated with canes of clear and opaque glass resulting in an effect known as filigree, plus vessels painted in enamels, and patterns created in the glass itself in imitation of the marble-like veining associated with chalcedony. The obvious similarity between certain glass compositions and precious stones was also of considerable significance, and as a result became a major factor in the enhancement of the glass maker's art.

The values attached to some materials have varied across different cultures. At the time of the West's earliest contacts with South America next to precious stones gold was the material that most Europeans wanted to control and acquire. In this context it is easy to see that when the Spanish conquistadors invaded Mexico and Peru, in the sixteenth century, they would, no doubt have been surprised to find the peoples they subjugated attached a greater value to jade. The Chinese shared a similar high regard for a material renowned for its hardness and hence durability. Burial suits consisting of squares of the mineral joined together with gold wire have been recovered from tombs datable to the H'an dynasty (206 BC-AD 220). The transitory nature of human life at periods before the emergence of a basic understanding of

medical practices would have made ancient minds acutely aware of the ever present threat of death and the body's inevitable decay. Thus encasing the deceased in a material of extreme hardness was believed to offer protection against evil spirits and, indeed, most destructive forces.

Surviving evidence indicates an early widespread preoccupation with hard materials such as flint and jade, followed later by diamonds and other precious stones. Diamonds not only possess aesthetic qualities in the form of purity and lustre (better known today as 'fire') they are also virtually indestructible. As early as the time of Pliny (the first century AD) an attempt was made at the classification of minerals according to their hardness. It was not, however, until the early nineteenth century that a German mineralogist named Friedrich Mohs drew up his now famous scale in 1812 thereby establishing a system of classification that has achieved international acceptance.

There are objects in our national museums which are neither especially durable nor are they made from intrinsically valuable materials yet are accorded a value which has much more to do with their historical associations. Objects of this type are often made from fragile, hence vulnerable materials and include such antiquities as the Shroud of Turin and fragments of The True Cross. Unfortunately, without supporting documentary evidence our belief in their authenticity and worth is essentially down to faith, so much so that the more skeptical amongst us might demand a level of proof that may remain elusive. The theory that the shroud, for example, was made during the medieval period, possibly the work of Michaelangelo, was given added credence when a small sample taken from it was submitted for scientific examination using what is known as a carbon 14 test. Interestingly, the results of this test have been cast into doubt with the discovery that the sample submitted for testing was in fact from a restored part of the shroud, and perhaps more importantly attributable to restoration carried out in the thirteen hundreds. In other words the test was contaminated by the presence of silk threads from a fabric that would not have existed in the Middle East in biblical times. Anyone who has seen illustrations of the shroud will know that it bears an image of a man with a close similarity to representations of Christ. Of special significance is the fact that it is a negative image, which if created for the purpose of deception at a time long before anyone had ever seen a negative, in other words prior to the invention of photography, would alone make it an exceptional achievement. However, establishing that the shroud is contemporary with the period of Christ is not the same as proving that it was, indeed His shroud. It must be remembered that during the Roman occupation of the Holy Land crucifixion was a common practice.