

## **MYSTICISM IN THE PAINT POT, DRAGON'S BLOOD AND SPIRIT VARNISH**

Surface finishing is another area in which amateur clock-makers or woodworkers delving into elderly texts can be bewildered by terminology.

### **Paint, Lacquer and Varnish**

Broadly speaking, paint has traditionally been a soft, thin, opaque, coloured film composed of pigment dispersed in an oily medium. The pigment predominates. Varnish, on the other hand, is a hard colourless, or lightly coloured transparent film. "Lacquer" is the name now given to varnish that in some ways simulates the properties of the medium used in Chinese lacquer-ware as long ago as 1000BC. "Enamel" is an opaque, coloured, varnish and is named for its similarity in appearance to vitreous enamel. "Japanning" is the process of applying several coats of heat cured coloured varnish to simulate vitreous enamel or Chinese lacquer.

The hardness of varnish results from the inclusion of resins. Resins are semi-solid or glass-like solid organic polymers. Most are not soluble in water but are soluble in alcohol, ether, and certain oils.

Varnishes are of two types. Oil-resin varnishes are a mixture of resin with a drying oil, such as linseed oil or tung oil, which dries on exposure to air through oxidation and polymerisation.

Spirit varnishes are simply a solution of resin in a volatile solvent. Since the resin films are inherently rather brittle, spirit varnishes often incorporate a plasticiser. The first varnish used to simulate lacquer was a spirit varnish and spirit varnishes came to be called lacquer in Britain. Many Americans will tell you that "lacquer" means nitrocellulose lacquer, a spirit varnish and the product we called "Duco".

### **Thinners**

If necessary, a thinner may be used to reduce the viscosity of the liquid varnish. The thinner needs only to be miscible with the varnish and need not be a solvent for the resin. The solvents most often used as thinners were oil of turpentine (now sold as "gum turpentine") and alcohol. Mineral spirits mineral turpentine, painters' and varnishers' naphtha, Stoddard's solvent, and white spirits are petroleum distillates that now serve as thinners, as is toluene/toluol/methyl-benzene. Note that water is soluble in alcohol and, if present, has the effect of giving the varnish a cloudy appearance.

### **Plant Resins**

Resins are formed in plants to act as a wound dressing. They are usually classified according to their form at the time they are gathered. Hard Resins are glassy when gathered and have little or no liquid mixed with them. Oleoresins and Gum Resins are found mixed with, respectively, fairly

volatile oils, or generally water soluble oils. Some Hard Resins are obtained by distillation of Oleoresins.

The Hard Resins include the varnish resins known as copals. These may be taken from living plants or as fossil material. There are several sources including the Kauri pine. Copals dissolve slowly and give very durable varnish. Amber is a fossil resin with similar properties.

A second class of hard resins used in varnish are known as dammars. Mastic is another hard resin, as is sandarac or juniper gum. These resins do not have the hardness of the copals.

Several Oleoresins are of interest. Canada Balsam is used as an adhesive. It has a refractive index very close to that of glass. Turpentine is an oleoresin obtained from certain pine trees. On distillation it yields oil of turpentine and the hard resin colophony or rosin. Oil of turpentine is the well known industrial solvent. Rosin has many uses including sizing paper, and as a soft or more plastic varnish resin. Similar resins include benzoin, elemi, and anime.. Dragon's Blood is an oleoresin obtained from the fruit of Daemonorops draco, Dracaena draco a palm tree native to SE Asia, and from other species of Dracaena.

The final oleoresin of interest is lacquer, the refined sap of a sumac tree of SE Asia. *Rhus vernicifera*. The principal component of the sap is known as urushiol. This true lacquer is highly resistant to heat, moisture, acids and solvents. It cures by a fermentation process and is not a spirit varnish.

### **Animal Resins**

The best known of the animal resins is lac. Lac is a secretion from any of several species of scale insect. *Laccifer lacca*. After processing the product is known as shellac or, at one time, shell-lac, stick-lac and -seed lac. The distinction between the three has now been lost. Naturally a pale orange, shellac may be bleached to give white shellac. The usual solvent for lac is alcohol and the resulting spirit varnish is known as lacquer, shellac, or french polish - all of which are misnomers.

### **Artificial Resins**

The wide array of artificial resins which are currently used to make varnish is outside the scope of this article.

### **Colouring Varnish.**

Each of the resins used in varnish has a characteristic colour. The principal use of Dragon's Blood, for example, is for imparting a red color to spirit varnish. Other colours may be imparted using traditional vegetable dyes such as turmeric and saffron. More convenient is the wide range of aniline dyes now readily available. For japanning, the colour is usually imparted by a pigment.