

**Reply to Comms 1927 and 1930:
Help with stuck bassoon tenons and wind-instrument joints**

The 'miracle liquid' used by a conservator to free a stuck component was most likely isopropyl alcohol (IPA, Isopropanol) or possibly white spirit. Isopropyl alcohol is a widely-used general purpose cleaner/solvent especially for non-polar substances such as oils and fats. Currently easily available from Maplin electrical stores, pharmacies or elsewhere in the UK and US, it is often used for cleaning and freeing grease-clogged or dirty electrical components such as switches and rotary potentiometers in electrical musical instruments and other electrical equipment. It is used to quickly soften leather for rapid stretching (as in tight shoes). Isopropyl alcohol is almost odourless and evaporates quickly at room temperature without trace. It is relatively safe and non-toxic in normal use, although prolonged exposure requires appropriate safety measures. If it were carefully applied to a tight wind-instrument joint it would penetrate quickly and tend to soften and lubricate the joint interface, which is likely to have been fitted with a linen-thread winding or cork-banding treated with some type of wax, grease or other fatty material during lifetime use.

Oils, grease and fats generally oxidise over time forming a thickened, sticky or hardened layer on a substrate. One can imagine how such material would act as an adhesive layer at the interface of a compressed clarinet or bassoon joint if left for a long period of time. Although these joints have limited exposure to oxygen the natural acids emitted from the wood would accelerate the oxidation process. Such joints are made to be airtight and it's not surprising that a sticky substance combined with a small natural expansion of the wood due to moisture absorption might cause problems.

Another possible penetrating and de-seizing option would be 'white spirit' which is widely used in museums as a general purpose solvent and cleaner. It's just a general mixture of C7-C12 aliphatic and alicyclic hydrocarbons. Your local hardware store stocks this material for cleaning paint brushes and other cleaning tasks. The type used in museums is normally a slightly more refined version with more precisely controlled composition. It evaporates quickly with little or no residue and would penetrate and soften waxy or greasy material in the seized joint as well as temporarily lubricating the area. Do not confuse this with 'Turps' or 'turpentine substitute' which typically contains resinous components that can form persistent, sticky residue on evaporation.

Remember that although these kind of solvents are widely effective for general cleaning they can dissolve or affect surface coatings or varnishes such as shellac or oil-based varnishes. Hence, the conservator in a museum might well use a syringe or other precise local application technique that would avoid damage to other components or features of an instrument.

Putting water on wood causes swelling and would not be recommended for freeing these type of joints as it would likely do more harm than good. Similarly, any type of oil applied would penetrate the wood itself and be very difficult to remove later, as well as oxidising over time as described. So

called 'Lemon oil' formulations are often used by luthiers and instrument repairers to treat, clean or improve the appearance of rosewoods, ebony and similar woods used in instruments making, but the long term effects are usually undesirable. 'Orange oil' is commonly found in citrus-smelling cleaning formulations as 'limonene' and can be used as a cleaner for label adhesives and other surface residues. It is an effective environmentally-friendly solvent, but its longer term behaviour needs to be considered for any particular application. Conservators generally avoid using materials or any treatments that alter objects, or their components or that are not reversible to a high degree, so although various oils and water-based materials might be used widely during instrument-making and maintenance, they are used only with informed caution in the conservation field.

As for lubricating wind-instrument joints during lifetime use; there are some dry lubricants available. 'Gig-dust' is one product and is a white powder that can be applied to the mating surfaces forming a dry lubricated interface. Its precise composition is not available, but it appears to be an inert mixture of mica dust (available from cosmetic component suppliers) and a silicone powder. Boron nitride powder is also effective and is used in industry as a clean and inert lubricant either in powder form, or as an additive to other types of lubricant formulations. Boron nitride powder is similar in structure to graphite and is sometimes called 'white graphite'. One popular use is for lubricating ammunition bullets and cartridges. Talcum powder, sometimes used by piano people is hygroscopic and because it absorbs moisture it cannot be advised for wind instrument joints.

Summary

- Isopropyl alcohol (pure without additives) or white spirit (purest available) carefully applied can be used to free seized joints. These are safe and potentially effective solvents, but care must be taken to avoid affecting surface coatings and varnishes.
- Oils, fats and water should be avoided if possible.
- Inert dry lubricants can be recommended for the joints of instruments in current use.

Chris Egerton

Stringed-instrument conservator

11 January 2015