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THE DEGRADATION OF PEWTER IN ANTIQUE LACE BOBBINS.

This article needs a couple of pics.

Pewter Degradation

Introduction

The pewter used in bobbins is one of the prettiest decorative processes that makers used. Unfortunately during the passage of time much of the pewter by some makers has degraded and has either fallen off the bobbin or has become swollen, misshapen and even crumbly. The following is my attempt, with the help of many people on the web and especially my friend Neil Keats, to explain this phenomenon.

Pewter.

Pewter is an alloy (i.e. a mixture) of tin and lead. The better the quality of pewter the higher the percentage of tin is in the alloy.

Tin exists in three forms, depending on the temperature. This is called polymorphism (poly-many, morphism-shapes). At temperatures between 13 and 160 degrees C, it is called White tin, and the atoms (think of them as little balls in this description) are packed closely together to form the metal. Hence, it is a dense metal, i.e. it is hard.

Below 13 degrees C the atoms rearrange to become more loosely packed (actually in the same configuration as diamond). This shows first as wart-like structures on the surface, and eventually leads to the tin crumbling into a powder. This is called "tin pest", and is what happened to the buttons on Napoleon's soldiers coats. I don't know how long this takes but it won't be very quick as all the atoms will have to move about - probably as long as it takes to march to Moscow from Paris ;-).

Above 160 degrees C, tin changes to another form called Brittle tin. Another form of packing for the atoms. But I don't think that will bother us :-).

The critical temperature is 13 degrees C. It does not happen suddenly but occurs over a period of time. The pewter has to be subjected to long periods of sub 13 degrees C, very easy in Europe! It appears that when the pewter catches "tin disease" some atoms change places, and in so doing crumbles the pewter and makes it swell. I also read that the atoms have different shapes in the two kinds of tin.

You can tell how pure the tin is in its pre processed state by bending it. The better the tin, the more it "Creaks" and feels like it is "Crumbling".

The disease is called "Tin disease". It attacks tin in its purest form but as it becomes more alloyed with antimony and copper it becomes less pure and thus less susceptible to pewter disease. That is why the antique bobbin makers that used the purest pewter have the most degradation in the present time.

The organ pipes of Europe and the UK were badly effected by it and this is due to the temperature change year after year in the cold churches. (a piece of trivia). I do not know the critical temperatures that changes it from grey to white but it is clear that the cold European nights turns the pewter into the white pewter and thence the powder type of tin disease that our bobbins show.

In Practice.

Just ordinary Solder is the metal of choice these days, though I personally use pewter.

Those makers in the past who used poor quality pewter have been fortunate enough to have the pewter remain in tact for our pleasure. Clearly it is the tin content that causes the degradation. For example Springett tells us that the composition of Jesse Compton's pewter was 78% tin, 2% lead and the rest antimony. Unfortunately for us this high quality pewter had degraded so much that most of his bobbins have now lost their pewter.

There is nothing that you can do to stop this once the tin disease has started. "Perhaps" keeping them in a warm ambient temperature might help, but it is doubtful.

To avoid tin disease in your bobbins:

- a. Make sure the maker uses a poor quality pewter!
- b. Keep the article in a warm place. i.e. above 13 degrees C

Leopards and arthritis.

Part of the lace making folklore is that those leopard bobbins that you see that have extruded spots of pewter were deliberately made by the bobbin maker. This is because it was thought by the lace makers that handling pewter with "prevent" or "reduce" the effects of arthritis.

Various arguments have been put forward by those pro and con this proposal. The cons say that handling these rough bobbins would give them sore hands, they also offer the suggestion that it the pewter/arthritis tale is an old wives tale and it does not work.

The pros say that not all the bobbins had protruding spots and in any case you can choose to handle the bobbins where the protrusions do not occur.

I have always said that I would take one of my bobbins to a laboratory where they could test the protruding pewter to see if it had tine disease and whether it was protruding because of the tin disease. Perhaps this would settle the question once and for all?

Meanwhile I err on the con side. I do not think that makers "imitating" the tigers spots on a bobbin would deliberately make them protrude. However if they were paid to make them protrude, well business is business!

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