

# **Past, Present and Future**

## **Changes in status and distribution of museum insect pests**

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## Museums and historic houses in the UK over the last 30 years



I have set up IPM in a wide range of buildings and collections, Hampton Court Palace 16<sup>th</sup> C, Brodsworth Hall 19<sup>th</sup> C; National Railway Museum York, Carriage replica of 1829; Natural History Museum London 19<sup>th</sup> C; Tate Modern London 20<sup>th</sup> C;

**Some of my clients live in large historic houses**



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Her Majesty Queen Elizabeth II owns and lives in Buckingham Palace, Windsor Castle, Sandringham and Balmoral; all with challenging problems.

## Why do we have so many different pest species in museums and historic houses?



I have always been intrigued by the wide range of insects found in our heritage world. A few examples : Carpet beetle *Anthrenus verbasci*, Odd beetle *Thylognathus contractus*, Booklouse *Liposcelis bostrychophila*, Deathwatch beetle *Xestobium rufovillosum*, Drugstore beetle *Stegobium paniceum*, Spider beetle *Ptinus tectus* and case bearing clothes moth *Tinea pellionella*.

## Where have woodborer pests in museums come from?

### Before man



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Insects have been around for millions of years; well before man came on the scene. Some woodborer beetles lived in dead trees and fallen branches.

## Where have woodborer pests in museums come from?

After man



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When man chopped down trees to make dwellings and to burn logs on fires he created a whole new habitat for woodborers to exploit.

## Where have textile pests come from?

Before man



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Textile pests such as carpet beetles and clothes moths adapted and evolved to live in bird nests and dead animals before man.

## Where have textile pests come from?

After man

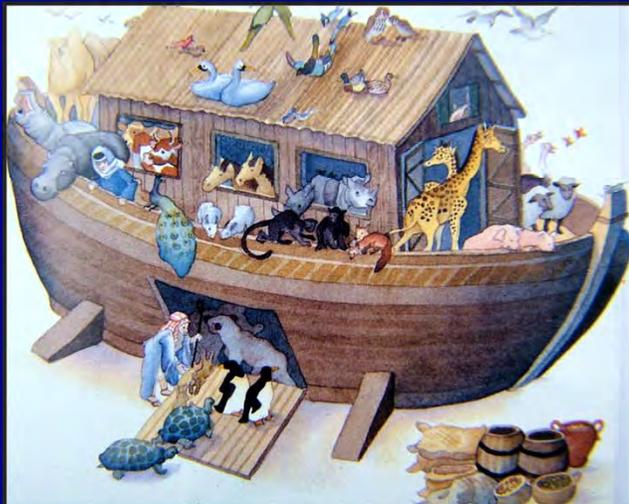


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When man started to live in settlements and make textiles, he provided a whole new habitat for textile pests. This is a very early example of pest damage to a Roman wool textile.

## Biblical references

“Your riches are corrupted and your garments are moth-eaten” James 5: 2



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Did Noah take deathwatch beetles with him on the Ark?

## Early verified records of museum pests from tombs in Egypt

*Stegobium*



*Lasioderma*



*Dermestes*



*Gibbium*



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Some of the earliest records of pest are from Egyptian mummies and tomb burials.

**As Monty Python said:  
“What have the Romans done for us?  
Spread pests around Europe!**

*Anobium*



*Tinea*



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*Sitophilus*



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## Exploration and trade and in the 16<sup>th</sup> and 17<sup>th</sup>C

What arrived with the Pilgrims on the Mayflower?



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It is very likely that the first settlers to arrive in the Americas also brought some pests with them, such as grain weevils.

## Increase in trade in the 18<sup>th</sup> and 19<sup>th</sup> Centuries

Australian spider beetle *Ptinus tectus*



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Trade between continents of wool, grain and other goods helped spread pests around the world.

## Increase in trade in the 18<sup>th</sup> and 19<sup>th</sup> Centuries

Webbing clothes moth *Tineola bisselliella*



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The origins of webbing clothes moths, now one of the most widespread and destructive textile pests, are not known. It seems to have arrived in Europe and the USA in the 19<sup>th</sup> Century, possibly from South Africa.

## In the 20<sup>th</sup> Century

Varied carpet beetle *Anthrenus verbasci*



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Although known in the 19<sup>th</sup> Century, carpet beetles really began to increase in the 20<sup>th</sup> Century.

## There are many species of *Anthrenus* across the world



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Although *Anthrenus verbasci* [top left] is probably the most common, there are many species worldwide. *A. sarnicus*, *A. fuscus*, *A. flavipes*, *A. museorum*, *A. scrophulariae* and *A. coloratus*

## Guernsey carpet beetle *Anthrenus sarnicus*

First found in the UK in London in 1971



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Guernsey carpet beetle first arrived in England in 1971 and has since spread around the UK. Initially hitching a ride on collections sent between museums, it is now the main pest in some buildings.

## Distribution of *Anthrenus sarnicus* in the UK in 2013

- Common in London
- Spread to a number of other museums
- Now being found in a few Historic Houses



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This map is from records on a database called [whatseatingyourcollections.com](http://whatseatingyourcollections.com)

## Brown carpet beetle or Vodka beetle

*Attagenus smirnovi*

First found in the UK in 1979



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Another new pest to the UK is *Attagenus smirnovi*, very similar to *A unicolor*, but with brown wing cases.

## Distribution of *Attagenus smirnovi* in UK in 2013

- Very common in London
- But only occasional specimens from elsewhere
- Is it not being recognised and is therefore under-reported?



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*A smirnovi* is now established in many museums in London and a few specimens have been found in other towns; including Oxford, Cambridge, Birmingham and Glasgow.

## **Brown carpet beetle *Attagenus smirnovi***

Now found throughout Europe as a domestic and museum pest

- Austria
- Czech Republic
- Denmark
- Finland
- Germany
- Norway
- Poland
- Romania
- Russia
- Slovakia
- Sweden
- Switzerland
- UK



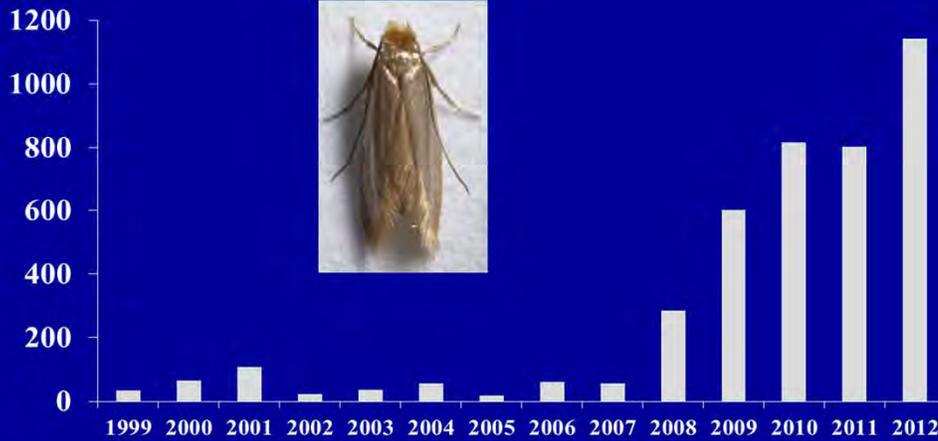
- **Has it arrived in North America?**

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It is now a major pest in many parts of Europe. Has it already arrived in the USA, but because of its similarity to *A unicolor*, has not yet been recognised?

## What has happened to some of our more common species? Webbing clothes moths *Tineola bisselliella*



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There has been a very large increase in the incidence and severity of infestations of webbing clothes moths in the UK the last 10 years. This is probably due to many interacting factors including: warmer winters, increase in the use of natural fibres, loss of some insecticides and decreased housekeeping standards.

## What will be the main causes of change to pest distribution?

- Movement of collections



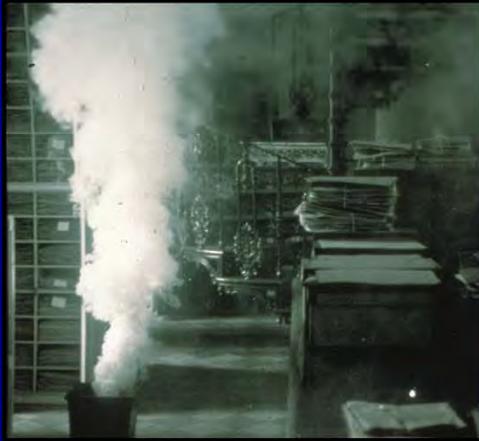
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The natural history collection is being treated in a ThermoLignum controlled humidity heat chamber to prevent pests being spread from an old infested store to a new clean store. The art installation called “Venus of the rags” is very attractive to clothes moths which can then be carried to another venue if not treated.

## What will be the main causes of change to pest distribution?

- Loss of pesticides



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Because of safety concerns, a number of pesticides have now been withdrawn or banned.

Dichlorvos [DDVP or Vapona] was particularly effective as a vapour insecticide against adult clothes moths, even at very low doses

## What will be the main causes of change to pest distribution?

- More extreme weather events –York 2013



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Extreme weather events can lead to building damage and flooding. This in turn increases risks from fungi and insect pests.

## What will be the main causes of change to pest distribution?

- General increases in temperature



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Insects thrive at higher temperatures. Many of our museum pests are semi-tropical in origin and even a few degrees increase will allow these pests to spread and increase.

## **How will we know?**

- **Better identification of pests**  
**Whatseatingyourcollection**
- **Improved communication**  
**Museum pests.net**
- **Better tools to plot pest distribution**  
**Whatseatingyourcollection**
- **More research on the effect of climate changes**

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Web based resources have transformed our ability to obtain information.

Some websites such as museum pests.net and Whatseatingyourcollection are accurate and reliable, beware of those that give misleading advice!

We need to share our information with others and accurately record what we are finding. We will then have a base line to see if there are real changes to pest distribution and pest risk.

## Museum pests.net has a key role in encouraging information gathering and analysis in North America



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A final thought.

Which pests were in the Americas before settlers arrived from Europe?

When did the other pests arrive and how and when did they spread across the continent?

Here is a challenge to find the answers to these questions.

This knowledge will help all those working in IPM understand more about their pests and how to combat problems.