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Biology Curators Group Newsletter

Title: Byne's Disease

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BYNE'S DISEASE

Most natural history curators will have seen a white deposit or a slight furry growth on the surface of shells. This is Byne's disease. The fact that it even has a name and has been described is of interest.

Unfortunately, as with Pyrites 'rot' or 'disease', the implication in the name is that a biological agent is at work. Also, once the symptom is removed, it is assumed the causative effect has also been dealt with. As there is strong evidence that external factors are the cause, the similarity with problems associated with pyritised geological material is again reinforced. Indeed, the entire story of the understanding and eventual treatment may well exactly parallel the latter problem.

One of the first jobs given to me in museum employment was to treat a collection of molluscs which had been donated. A large proportion of the shells were showing the signs of Byne's disease. Treatment consisted of boiling each specimen in water for a few minutes and then, when dry but still warm, rubbing each shell in the hand with a small quantity of petroleum jelly. Naturally, the problem of keeping the labels with the appropriate lots in a collection of several thousand shells made this a laborious task. It was done to render the shell surface and pattern visible again and to prevent both further decay and possible 'spread' to the rest of the collections when the specimens were incorporated. (Again, the 'disease' concept which may not be valid.)

In collections of birds' eggs, there appears to be a similar problem. Eggs are universally stored in cotton wool. Wagstaffe and Fidler, 1968, *The Preservation of Natural History Specimens*, volume 2, specifically mention a storage problem in this respect. They advise changing the cotton wool biennially, or more often, in conditions of dampness - "otherwise, the eggs may become mouldy and in consequence permanently stained". They also state that this 'mould growth' shows up under ultra-violet light as yellowish or orange patches. This is certainly the case with specimens that I have examined.

The substance in common in these two groups of museum specimens is calcium carbonate. Recent research shows that the Byne's disease symptoms are products of the effect of acid vapour and humidity on this compound. Whereas the exact chemical processes have not been defined, it is clear that storing such material in oak or other acid-producing timber cabinets in high humidity conditions is the major contributory cause. Similarly, the use of acid-free card for trays, boxes, tissue and cotton wool will relieve the problem. These same considerations have also to be borne in mind by the curator in respect of pyritised fossils and objects of pure lead.

There are various questions which spring to my mind in connection with this problem:

Why does the Byne's disease affect some species or groups of species more than others?

What is the best interim treatment, on the assumption that the cost of replacing all cabinets and installing air conditioning is financially impossible?

Does the UV fluorescence mentioned above result from the products of calcium carbonate alteration, or do these fungal hyphae - if such they are - have similar properties?

For how long do oak cabinets continue to release acid vapour? As many such cabinets are over one hundred years old, this may be of relevance.

The overall conclusion is obviously that natural history curators need the expert advice of conservators. I am indebted to Dr. Norman Tennent of Glasgow Museums, who is currently investigating the phenomenon, for much of the above information. Any curator who has evidence of Byne's disease should contact him as he is anxious to gather data on its incidence and to measure the various parameters. There is a strong case for the establishment of conservation staff attached directly to the natural history departments of larger museums. Current back-up facilities for curatorial staff are usually confined to a taxidermist, whose work in that specific sphere does not fulfil the requirements across the extensive range of material found in natural history collections.

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Footnote

Some additional facts have come to my notice as a result of this note. The last paragraph is of direct relevance to biology curators - please respond. For example, the additional presence of salt in marine molluscs (especially if not cleaned properly) may be a factor. Has anyone seen Byne's disease on freshwater or terrestrial shells? Also, despite the fact that the most obvious items of calcium carbonate in a museum collection will be found in the mineral cabinets, I have not heard of a geologist ever complain of symptoms of this effect damaging the calcites, etc.