

### PROPOSED CLASSIFICATION OF FOXING

When studying or discussing foxing there is the difficulty which is repeatedly pointed up by the question; "Are we talking about the same thing?" More precise definitions and descriptions are necessary if we are ever to understand foxing. As a first step we began to differentiate among the various types of discoloration which have been termed "foxing." In the process the following classification scheme was developed.

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- CLASS 1. SMALLER SPOTS WITH DARK CENTER AND CONCENTRIC RING(S) OF LIGHTER RED-BROWN TO YELLOW WHEN VIEWED IN VISIBLE LIGHT. HAVE PARTICLE AT CENTER. MAY BE TERMED "BULLSEYES."
- A. OUTER RING(S) FLUORESCES, USUALLY YELLOWISH, UNDER NEAR-UV. MAY BE SPHERICAL, EXTENDING THROUGH SEVERAL PAGES.
  - B. OUTER RING(S) APPEAR VERY DARK BLUE TO BLACK UNDER NEAR-UV. APPEAR TO RESULT FROM EMBEDDED METAL PARTICLES.
- CLASS 2. SPOTS WITH SCALLOPED EDGES AND/OR IRREGULAR SHAPES WHICH CAN BE UP TO INCHES ACROSS. APPARENTLY HAVE HIGHER IRON CONCENTRATIONS THAN SURROUNDING PAPER BUT CONCENTRATION MAY VARY WITHIN AREAS OF THE FOXING. MAY BE TERMED "SNOWFLAKES" FOR APPEARANCE UNDER NEAR-UV.
- A. APPEAR RED-BROWN TO YELLOW IN VISIBLE LIGHT AND FLUORESCES PALE-YELLOW TO WHITE IN NEAR-UV.
  - B. NO APPARENT OR VERY FAINT COLOR IN VISIBLE LIGHT BUT FLUORESCES SIMILAR TO 2 A UNDER NEAR-UV.
- CLASS 3? AREAS WHICH CORRESPOND IN SHAPE TO A PRINT OR IMAGES WITHIN A PRINT FROM THE FACING PAGE. APPEAR YELLOWISH IN VISIBLE LIGHT AND A UNIFORM PALE BLUE-WHITE TO WHITE UNDER NEAR-UV. MAY BE TERMED "OFFPRINTS." CONSIDERED STAINS RATHER THAN FOXING.
- CLASS 4? SIMILAR TO CLASS 3 EXCEPT THAT UNDER NEAR-UV THE SHAPE OF THE YELLOWISH AREAS CONFORM TO THE SHAPE OF THE BODY OF THE PRINTED TEXT. MAY BE TERMED "SHADOWS." CONSIDERED STAINS RATHER THAN FOXING.

Results from our foxing studies suggest that in this scheme only classes 1 and 2 should properly be considered as foxing. Foxing was taken to differ from other discolorations by having the following characteristics.

- a. foxing is induced by some agent;
- b. foxing develops with time at a rate dependent on the nature of the paper, the attacking agent, and environmental conditions;
- c. foxing, unlike stains, can continue to increase in size and intensity with time (it can "grow").

On the other hand, classes 3 and 4 should properly be considered as stains rather than as foxing. For example, their shape and location is determined by an image present on the paper; as in the "reflection" on a tissue sheet of an image from an engraving on the facing page. Foxing of class 1 or 2 can occur with and within stained areas.

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