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PARASITOLOGICAL EXAMINATION OF MATERIAL FROM THE WILSFORD SHAFT, WILTS. (1962). 438 772

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Summary

Pellets of compressed vegetable matter from the Wilsford Shaft were examined to assess if they were faecal pellets. The presence of low concentrations of coccidian oocysts and the nature and state of the grass fragments forming the pellets indicated that the samples were faecal. No helminth ova were present. It was not possible to detect which species of herbivore passed the pellets.

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Parasitological examination of material from the Wilsford Shaft (1962), Wiltshire

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Introduction

Three small vials containing compressed pellets of vegetable matter were submitted to the EAU in order to determine if the material was ancient faeces. The pellets varied in size between roughly 5 and 12 mm across by 1 to 3 mm thick. They were irregular in shape, some being sub-circular, others rounded while some were markedly angular. The material submitted was a small sample of similar pellets which were recovered from several layers filling the Wilsford shaft. It is unlikely that such a volume of material could have become incorporated into the deposits accidentally.

However, air-borne contamination of the shaft fills was considered to be a problem. In order to counter this, samples of pellets were carefully washed in warm running water to remove the preservative and any fine objects adhering to their surface. One gramme of washed pellets (approximately 10) from each of samples 248/7, 248/109 and 291/184 were placed in 14 ml of dilute sodium pyrophosphate solution for disaggregation. This process was facilitated by teasing apart the compressed vegetable material and gently shaking the vessel containing the suspension. It should be noted, however, that despite much effort,

disaggregation was never complete.

The samples were then poured through a freshly flamed 250 micron aperture meshed sieve to remove coarse particles. Measured aliquots of the filtrate were placed on microscope slides with two drops of warmed glycerine jelly as a mountant. Samples were scanned at X 120 and all ova and cysts measured using an eyepiece graticule calibrated to a stage micrometer at X 400.

Results

The overall appearance of the material, when viewed using both low power dissecting and transmission microscope, suggested that the pellets were indeed faecal in origin (see Tomlinson, 1987). The bulk of the cellular material was triturated fragments of grass stem and leaf in a form consitent with having passed through a herbivore's gut. Secondary thickening annuli and fragments of spiral thickening of xylem vessels also showed the material had partly decomposed. A few moss leaves were present.

The filtrate contained large numbers of pollen grains, principally of grasses (Graminae). Fungal spores were present in low concentrations in all samples, these were not further identified.

One sample contained structures which were identified as oocysts of coccidian parasites, probably <u>Eimeria</u> or <u>Isospora</u>. Coccidia are common protozoan parasites of the epithelial cells of the intestine of vertebrates. The oocysts from sample 248/109 were roughly pear-shaped structures which could not be further

identified although they appeared to possess a terminal micropyle. They measured approximately 8 X 7.5 microns. The oocysts indicate that the pellets are feacal in origin.

In addition, ovoid structures, which at first sight resembled the eggs of intestinal nematodes, were also present. These were relatively thick-walled and overall measured roughly 62 X 25 microns and lacked any distinctive features, several were enclosed in an outer envelop measuring 65 X 29 microns. These structures were shown to Professor D. L. Lee of the Department of Agricultural Zoology at the University of Leeds who was unable to identify them. He did, however, agree that both the form and composition of the original pellets were consistent with herbivore faeces.

While it is impossible to be certain which species produced the pellets, the species most likely to be responsible include sheep, goat and hare.

Conclusion

Two lines of evidence suggest that the material from the Wilsford shaft was faecal in origin. First, the samples were composed of triturated grass fragments which had begun to disintegrate. Second, low concentrations of coccidian oocysts (Protozoa), were found in one sample. No helminth eggs were identified. The material is almost certainly herbivore dung.

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Reference

Tomlinson, P. R. (1987) Plant materials from excavations at the Wilsford Shaft, Wiltshire, 1962. Ancient Monuments Report.