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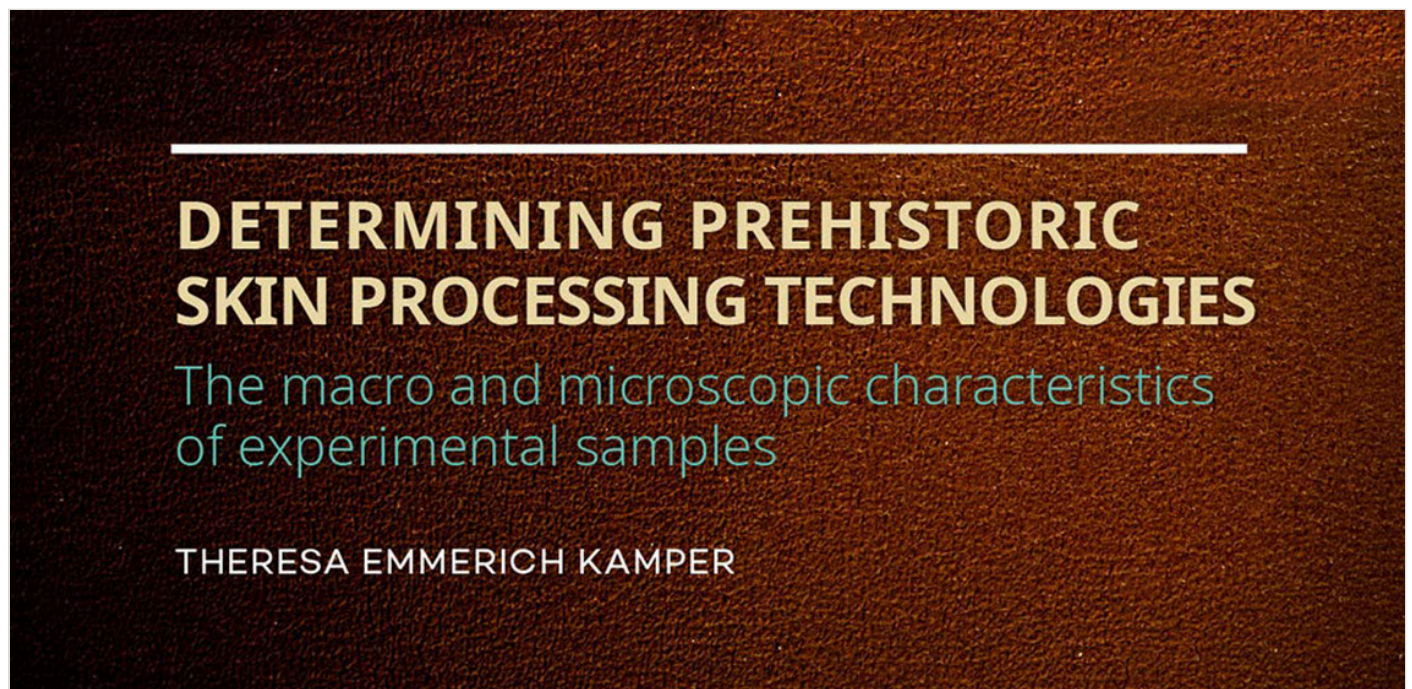
# Book Review: Determining Prehistoric Skin Processing Technologies by Theresa Emmerich Kamper

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This volume on prehistoric tanning technology is the revised and expanded version of the dissertation submitted to Exeter University in 2015. It is noteworthy in that it places experiment at the heart of the entire research programme, thereby radically changing the perspective from which archaeological and ethnographic artefacts might be approached. As the author comments in the Introduction, the original intention was to examine surviving leather artefacts in museum collections in order to establish the sort of processing

techniques that had been employed. But in the absence of any previous systematic research into the visible traces left by the different methods, and the unsatisfactory nature of existing physical and chemical analyses, Emmerich was compelled to start afresh and from the very basics, constructing her own standardized reference collection through a carefully constructed series of experiments.



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These document the effects of six different tanning methods on the skins of 22 selected mammal species. In effect, she inverts the query: instead of working back from the artefact, she begins with the skin and works towards the finished product. The study aims to “develop... a systematic method for differentiating between prehistoric tannage technologies” (p. 17) based on the macro- and microscopic traces left by these processes and visible on the surviving artefacts. Drawing on her personal experience of tanning methods, coupled with a thorough knowledge of survival skills, Emmerich embarks on an ambitious programme of experiment, but unlike many such attempts at re-creating primitive technologies, she applies a rigorous academic framework within which the experiments can be compared and evaluated.

The presentation and analysis of these results forms a fundamental work of reference for all aspects of primitive methods of skin processing and it is a model of experimental methodology. The first part of the study will be of most

interest to archaeologists, historians of leatherworking technology and those involved with living history projects or public presentation: the second part, with the analytical discussion, is of greatest value to those concerned with the registration, conservation and display of museum collections, where knowledge of the tanning agents employed is essential for the continuing care of the artefacts. There is of course considerable overlap between these interest groups, and throughout the study fascinating insights and comments crop up that are also applicable to other fields. For instance, the attention paid to physical characteristics such as the drape or translucence of leather may seem less relevant to archaeological finds, but have a direct impact on visualisations of prehistoric life, confronting us with the likelihood of sophisticated clothing and even with the presence of windows using translucent rawhide or brain-tanned skins.

Following a discussion of research aims and methods (Chapter 2), Emmerich explores skin selection, focusing on the most commonly exploited mammals in Europe and North America with comments on the properties of individual species that shed light on possible selection criteria (Chapter 3). Using considerable ingenuity –from rare-breed herds to roadkill– she has striven to obtain an extensive reference collection of wild and domestic mammal skins for the

subsequent tanning experiments, but she is also frank concerning the difficulties inherent in sourcing animal materials for use in experimental research. She stresses that skins are not merely a by-product of food procurement, but are deliberately sought for their specific properties. A case study in Chapter 9 forms a good illustration of the skilful use of different skin types and textures. The care in the selection of specific skins for particular purposes – practical, decorative or symbolic – has significant implications for the interpretation of prehistoric faunal assemblages, as species may have been sought for the quality of their skin well outside the local territory, and even small rodent skins could be usefully exploited.

The core of the study is Chapter 4. Here, Emmerich tells you all you need to know about simple tanning methods, what tools you'll need, how to proceed, what to watch out for, how long it all takes, what the result of the different methods on the different animal skins will be, and for what purpose the end product is best fitted. First, she explores the preparatory actions (wet/dry scrape, hair on/off, grain on/off), resulting in six variants for each of the selected species. These are each treated with all six ethnographically documented procedures: fat/brain and smoke, bark, alum, urine, rawhide. Each method is described step by step and each method is subjected to detailed macro- and microscopic analysis on a series of characteristics ranging from texture and pliability to translucency. Both the experiments and the subsequent analyses (Chapters 4,5,6) are documented with copious, highly informative photographs (often of the author in action) and the results are comprehensively presented in both tabular and photographic form, clarifying the visual effect of the different tanning methods. This section forms an impressive factual database and a valuable source of reference for all aspects of ancient tanning technology, whether it is the replication of tanning methods or the accurate registration of museum objects. It also clears away a lot of ill-founded assumptions and myths surrounding primitive tanning methods (chewing as a form of tanning, for instance).

In discussing the problems encountered during this work, Emmerich gives an insight into the issues faced by prehistoric people and shows that although a method may be theoretically possible, the result may be so unsatisfactory that it is unlikely to have been used as an independent process, e.g. urine and –in prehistory– alum tanning. She herself clearly favours brain tan as an effective method, using easily accessed materials especially in combination with wood ash as a de-hairing agent. The observation that the brain of a mammal is almost always sufficient to tan its skin could only be made by someone with her background, and solves a lot of the problems surrounding the availability of other substances: seasonality, storage and extraction. Though there was no intention to reproduce archaeological tools in this particular research programme, I was interested to see that Emmerich frequently employs wood and bone implements: such tools are rarely recognized in the archaeological record as they are so simple. Striking also is the importance of handles and grips on her tools, again something that is sometimes neglected in archaeological studies.

The action of the various substances and the chemical processes involved are clearly explained, and I found much that clarified features on excavated leather artefacts that I had previously failed to appreciate. A case in point is grain-on/grain-off skin preparation to ease the penetration of fat, brain or oil. This is standard in North American traditions but has not been an issue in the analysis of ancient European or Egyptian leather finds. So I now seriously question my own observations: have I confused deliberate removal with wear and decay? Have I thereby missed an important preparatory technique? This is but one instance where Emmerich's experimental approach has consequences for the way artefacts are described and registered. Viewing the process as a whole, from start to finish, goes some way to explaining the often inconclusive results of standard tanning tests and analyses, since each step leaves its own signature, forming a complex palimpsest. Here, practical solutions to these puzzles are presented.

The practical application of the methodology is reviewed in Chapter 7 (In-Life Use Traces). Using her own reference collection of traditionally tanned clothing and other artefacts, as well as the experimental database, Emmerich analyses traces of wear and tear that are determined by the tanning method. These are quite simple, easily observable features such as edge morphology, the form of stitch holes, or the presence or absence of the grain surface and tool marks on the flesh-side of the skin that reflect the probable tanning method. High-quality photographs provide an invaluable source of reference for archaeologists dealing with artefacts preserved in bogs or waterlogged conditions where chemical analysis is unreliable, or where natural tanning processes might be involved. Regrettably, the results of Emmerich's examination of archaeological and ethnographic artefacts from museum collections could not be fully presented here, though the intention is to publish these studies at a later date. The list of objects examined raises intriguing possibilities: are there developments through time, are certain tanning methods geographically distinct, can tanning methods be used to characterise finds from caves or glaciers? For those with experience in this field, careful reading of the earlier chapters will give sufficient information to recognize significant features in their own collections, but the lack of these case studies does make it difficult as yet to assess the practical application fully.

Instead of working back from the finished product, Emmerich regards the tanning process as a choice of methods to achieve a desired result. This change of perspective not only explains the shortcomings of many of the previous analytical procedures used to identify tanning agents, but also raises questions as to whether isolating individual substances is obscuring the complex decision-making involved in choosing the skins and the tanning and finishing processes. A series of illuminating flow diagrams in Chapter 2 invites us to think more seriously about the place of skin working in prehistoric communities and the time and effort involved in achieving the desired result.


Here, however, the 'timeless' approach is a drawback. The -unstated- focus is on hunter/gatherers, but little consideration is given to the feasibility of the procedures in prehistory, or to the possibility of development and changes through time. Methods suitable for mobile communities will differ from those available to settled farmers for instance, and technical knowledge can spread between even the most primitive of communities as a result of trade in commodities such as pelts, tools or containers. Time depth will probably play a more prominent role when the museum artefacts that were examined for the thesis (Chapter 8) are published in the kind of detail that was not possible here. Analytical results need to take probability and historical context into account: it is uncertain, for instance, whether neatsfoot oil could be extracted before the later middle ages, and it is unlikely that egg yolk could have been widely used before the advent of poultry yards in Roman and Medieval times. Conversely, it is likely that some ancient methods became obsolete in the face of technological developments elsewhere and changing economic circumstances: the use of pork fat to treat an ox hide would not now be considered feasible, but was evidently current in ancient Greece until vegetable tanning replaced this labour intensive (and, according to ancient authors, smelly) method. Similarly, the use of vegetable oils is only touched on, though these were general in ancient Egypt (sesame and castor oil) and Mesopotamia (sesame oil), and may also have been used in later prehistoric Europe (camelina sativa). Nevertheless, the visual methods for identifying tanning procedures developed by Emmerich, and the much-improved understanding of prehistoric skin processing provided by her meticulously documented experiments, open the way for future systematic research into the history and development of leatherworking practices.

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