‘There’s Something Rotten in the State...’: Bad Smells Inantiquity

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'There's something rotten in the state . . .': bad smells in Antiquity

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Abstract: Smells are extremely important in everyday life. They provide information concerning our environment and evoke associations. In archaeology, however, similarly to other aspects of life in the past, smells can be studied only indirectly. In this study, the organic remains of animal exploitation have been studied at various (prehistoric, classical and medieval) sites. Having identified the sources of bad smells, their distributions were studied in the light of prevailing wind directions and settlement structure. Culturally different attitudes to 'bad' smells are also discussed.

Keywords: decay; livestock trade; prevailing wind; purple dye; smells; tannery

Introduction

Archaeological excavations offer only fragmentary evidence from the material culture of past peoples. The smell of freshly uncovered earth has replaced the plethora of sensory stimuli found in past human settlements. Smells evoking important contextual associations, however, are an integral and idiosyncratic factor in human culture.

Similarly to the sense of touch, as approached by the British phenomenologist Rodaway (1994), smells are directly related to the tactile receptivity of the body. Inherited olfactory information indicative of the individual's own condition plays a major role in intraspecific communication. Moreover, a major body of acquired associations is related to smells in one's immediate environment. They range from the comfortable fragrance of freshly baked bread to the obviously frightening stench of a badly neglected hospital and have, in part subconsciously, influenced human behaviour.

In the nineteenth century, when archaeology emerged as a vigorous new discipline, Victorian/Biedermeier attitudes in the élite western social strata suppressed this most organic aspect of all reconstructions. That academic approach stemmed from an increasing awareness of both good manners and hygiene, both class-related concepts. Our own attitudes (whether positive or negative) to the object of study often remain implicit in scholarly discourse, potentially

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compromising the 'objectivity' of arguments (Alexandri 1995:65). In the case of bad smells, the topic seems to have been simply ignored. In spite of the evident risk of ethnocentric bias, the consideration of smells contributes to our understanding of coeval environments.

THE MEANINGS OF SMELL

As Alexandri (1995:61) has pointed out, 'the tension between notions of variability and notions of "universals" and their intrinsic relationship to "meaning" is a central problem in archaeology'. Similarly to ancient music, however, owing to their largely intangible nature, smells and their meanings have been poorly studied, much less understood in archaeology.

The awareness of and manipulation by scents has a long tradition and has recently been revived in the form of aromatherapy and other New Age forms of natural healing (e.g. Cooksley 1996). Historically, the importance of 'good' aromas is attested by the well-documented significance of the ancient spice trade as well as the high value of myrrh and other substances used as incense. These examples point to the element of supply and demand as well as a number of other cultural factors that govern variability in the appreciation/tolerance of certain smells.

Diachronic variability in the changing appreciation of aromas is best illustrated by a modern analogy. Recently, there has been a rapid shift in the perception of the distinct smell of tobacco smoke: the former grandeur tends to be replaced by a hostile sense of group identity felt by smokers in the face of anti-smoking campaigns. The kudos attached to this smell as a symbol oscillates visibly with fashion, a function of both economic and cultural trends.

Cultural variability in the tolerance of 'bad' smells illustrated in this article does not mean that the values attributed to smells should be considered entirely relative. It would be misleading to conclude that attitudes to smells in humans do not have an inherited, 'instinctive' component. Among animals with no cultural prejudice, pigs and geese need separate pastures, because cattle, sheep and especially horses do not fancy grass soiled by these animals. One reason for rotating pastures is that most domesticates also temporarily avoid areas overused by their own kin (Baintner 1976:514).

As for archaeological evidence, one can hope only for those most extreme of situations in which attitudes to robust smells may be reconstructed. Owing to the fact that most characteristic smells are emitted by a range of organic materials in various stages of decay, animals (and humans themselves) may be considered a major source. Since human and animal metabolisms have not evolved during the last 10,000 years, given the laws of entropy, actualistic studies in this regard seem simple. In fact, however, this topic lies at the long neglected intersection of scientific and impressionistic archaeological enquiry and as such, it deserves multidisciplinary exploration.

Examples in this article derive from archaeozoological studies carried out by the author over the last decade. They were singled out on the basis of concentrations of animals/animal products that must have dominated the atmosphere even in their

broader environments. Focusing on smells at these sites reveals new aspects of settlement structure and cultural attitudes that have not yet been considered.

CASE STUDIES

Attitudes to smells, reconstructed from animal remains brought to light at archaeological sites, will be discussed within the following contexts:

1. Live animal trade (Vác – Széchenyi Street, sixteenth-century Hungary)
2. Tanning and fur processing (Vác – Széchenyi Street, sixteenth-century Hungary and Saint Blaise – Bains des Dames, Swiss Neolithic)
3. Shell middens and processing (Tel Dor, Israel, Persian period)
4. General considerations: meat processing, carcass disposal and scavenging

Live animal trade

The smell of live animals is determined by their specific metabolic excretions. While historical and ethnographic examples abound concerning humans and animals even sharing the same indoor space, a special case was singled out here to illustrate the potential impact of live animals in an urban setting.

The 70–80 per cent contribution of cattle to the identifiable bones at late medieval (thirteenth–sixteenth century) sites in the town of Vác (northern Hungary; Bartosiewicz 1995a:193, Fig. 3) illustrates the role this urban centre played in large-scale cattle-trading (Bartosiewicz 1995b). Massive beef consumption was rooted in copious supplies. Ottoman Turkish toll registers from the city (Káldy-Nagy 1968:39; Vass 1975:153) offer a glimpse of sixteenth-century urban life here that supports this hypothesis. Located at a point where cattle driven westward crossed the Danube river, the city formed a seasonal bottleneck by the end of the summer fattening period. Statistical parameters of herd sizes and daily trade are summarized in Table 1.

During the late summer and early autumn, cattle drives, on average numbering 1300–1400 animals *per diem*, were driven through the city on active trading days (a dozen herds numbering 100–120 animals). It is known that the Hatvan Gate (see

Table 1. The number of cattle recorded in Turkish toll registers in Vác

Period	1560 August–October	1563–1564 July–February
Number of trading days	18	23
Total number of cattle registered	27,901	30,248
Mean number of animals in herd	124	103
standard deviation	110.7	56.5
minimum herd size	3	3
maximum herd size	778	369
Daily mean number of herds	12.1	12.8
standard deviation	11.7	6.4

Table 2. Estimated daily pollution caused by cattle driven along Muddy Street

	1 individual	500 individuals*
Live weight of medieval cattle (kg)	250–300	125,000–150,000
Mean daily output of urine (l)	7.5	3750
Mean daily output of manure (kg)	32	16,000

* On September 22 1563, over 6000 individuals were recorded at the Vác toll station!

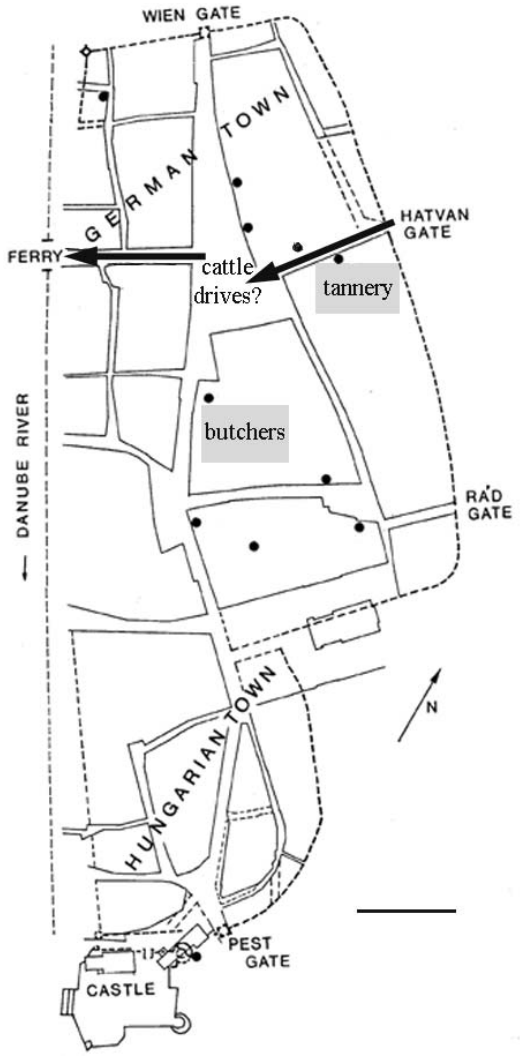

Figure 1. *Plan of late Medieval Vác with sources of animal smells (labelled). Dots indicate excavated archaeological sites. Scale bar = 100 m.*

Fig. 1, *Hatvan* is the nearest major town to the east), a strong iron construction, served as the main thoroughfare for traffic that arrived from the northern section of the Great Hungarian Plain and proceeded along Muddy Street toward Market Square and the crossing point on the Danube river (Torma 1993:425). In the light of the catchment area of the cattle trade (Bartosiewicz 1995a: 193, Fig. 4), in 1563–1564 at least one-third of the herds brought to town crossed through the Hatvan Gate. Even if no more than 500 beasts are considered a day, the load on the street surface must have been tremendous, as is suggested by Table 2 (parameters from Baintner 1976:348).

The sheer weight of 500 animals must have caused plenty of damage to unpaved (Pounds 1974:278) medieval streets. Although each beast would have spent only around two minutes in Muddy Street, some of the daily mean excreta would inevitably have ended up here. (Compare these data with the 'modest' daily squadron of a dozen carts loaded with horse manure in nineteenth-century Regent's Street in London; Smith 1974).

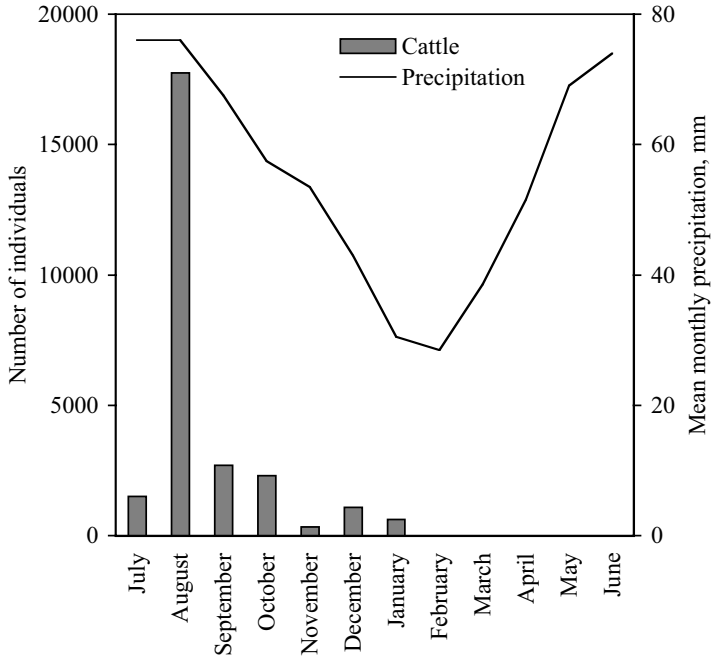

Figure 2. *Annual precipitation and cattle trade in Vác in 1563–1564.*

In addition, cattle drives culminated in the summer/autumn rainy season in Hungary (Fig. 2). Since the annual rainfall is estimated to have been some 125 mm more in the sixteenth century than today (Rácz 1999:220, Fig. 6), one can see that Muddy Street was not given its name for nothing. And the rest of the streets trodden by such contingents of cattle probably did not fare any better. Smells not only travel more effectively in humid air: if masses of excrement had no possibility to dry out, the heavy smell must have ruled the streets on bad days. Indol (C_8H_7N) and closely related methylindol (a.k.a. scatol: C_9H_9N), crystalline components providing the characteristic smell of faeces, must have been prominent substances in the air. Urine decomposition may have produced quantities of ammonia (NH_3).

In fact this hypothetical, very non-urban situation raises the question of whether the animals might have been herded to the river crossing via some detour, avoiding the city's core. Complaints filed to the bishop of Vác, however, reveal that tax collectors often insulted herdsmen at the *tricesima* office located on Market Square (Torma 1993:432). This makes it likely that the herds indeed crossed the town's centre. In addition, numerous polluting guilds which relied on the herds in transit (tanners, butchers; see later in this article) also used the Muddy Street area.

Alternatively, a separate animal market may have existed outside Hatvan Gate. This was the case in medieval Pest, where masses of animals were apparently kept outside the city walls in front of that town's Hatvan Gate (an area that happens to

correspond to our downtown university campus!; Vada 2000:22). However, there is no evidence of a corresponding area from Vác.

It must be mentioned here that, although horse dung unquestionably accumulated in quantities at major settlements, its smell seems to be better tolerated in many cultures.

Tanning and fur processing

In large ungulates, osteological evidence for skinning occurs in the form of fine transversal cuts, typically on the distal ends of metapodia and on proximal phalanges. Cuts, made with sharp blades, are less common on smaller, fur bearing animals whose skinning requires more caution (Bartosiewicz 2003:115, Fig.14).

Tanning was an extremely polluting industry in ancient towns. Although decay may have been less of a risk when fresh hides were treated professionally on an industrial scale, the mere quantity processed must have produced a rather robust smell.

By the fifteenth century, the leather industry was well developed in Hungary (Léderer 1952:252). It utilized not only salts and tannic acid, but also substances such as the urine and faeces of various animals (urine seems to have been the lotion of choice for alchemists as well as in a number of ancient technologies). Bird excrement, rich in uric acid ($C_5H_4N_4O_3$), was applied in buffering the quicklime (CaO) used in softening and de-hairing cattle and horse hides. 'Milder' dog faeces served the same purpose in the processing of fine sheep and goat skins. Finds indicative of this technique came to light from a bootmaker's workshop at Molnár Street, Budapest (Vörös 1996:242, Fig. 4), also supported by unambiguous medieval iconographic evidence of collecting dog excrement for this purpose (Nagy 1971:202, Figs 24–25).

At least five of the 59 fifteenth–sixteenth-century pits found south of Muddy Street in Vác had an oblong shape, were lined with planks and reinforced by vertical wooden stakes at the four corners. In addition, they contained a dark, organic fill. The excavator concluded that these features had been used as tanning pits (Miklós 1986:242). Her assumption is supported by similar late medieval features from the town of Debrecen (Sőregi 1939–40:32) as well as by a sixteenth-century woodcut from Nürnberg (Fig. 3; Schmid 1974:8) which shows similar structures. In addition, the presence of cattle horn cores and phalanges correlate in the Vác bone refuse ($r = 0.957$; Bartosiewicz 1995b: Table 26): the same contemporary woodcut also shows how horns and dry limb bones are still attached to the raw hides taken to the tannery (Fig. 3). The dominance of bones from adult and mature cattle further supports the hypotheses of hide processing (Schibler and Stopp 1987:327).

Already by the fourteenth century, large-scale hide exports were documented in Hungary (Miskulin 1905:72). The Vác customs registers (Káldy-Nagy 1968:39; Vass 1975:153) suggest that traffic in hides during a period corresponding to that of the live cattle trade (August to October) doubled between 1560 and 1563 (see Fig. 4).

While there is little doubt that the tanning industry made the area of Muddy

Figure 3. *Tanning facilities; sixteenth-century woodcut from Nuremberg, Germany (Schmid 1974).*

Street additionally smelly throughout the year, it is noteworthy that the tanneries were located at the north eastern edge of the settlement. With the prevailing winds blowing from the north along the Danube river, the southern part of the late medieval town would have escaped the worst of the air pollution caused by this activity. In fact, the bishop's castle and affluent neighbourhoods were located south-west of this area (see again Fig. 1). The aforementioned bootmaker's

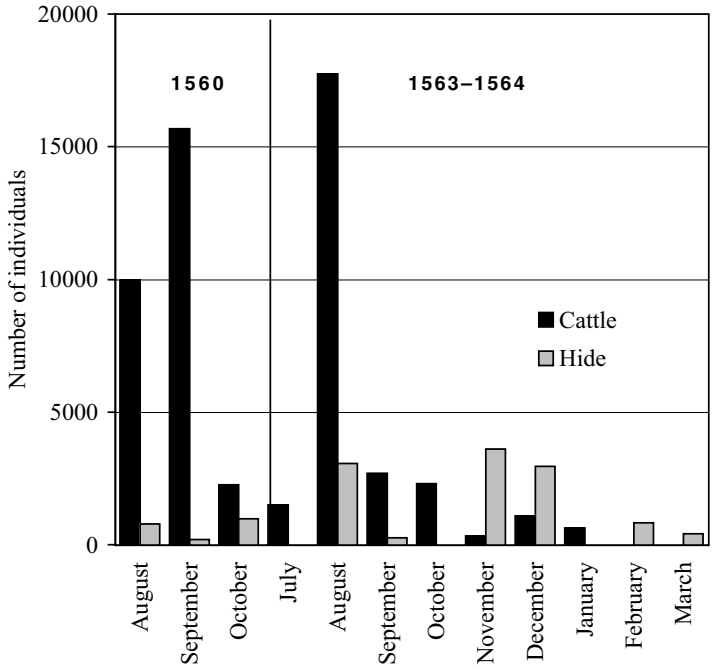

Figure 4. *Monthly changes in trading live cattle and hides in Vác.*

workshop uncovered in the medieval city of Pest was located near the Danube within the southern city wall, so that the northern wind swept most smells out of town along the river (Irásné Melis 1996:211, Fig. 1).

Another example worthy of brief mention was observed at the late Neolithic Swiss lake dwelling of Saint Blaise–Bains des Dames, located on the northern shore of Lake Neuchâtel. Rescue excavations at this settlement successfully identified the southern edge of the habitation area. Among the house remains recovered at the prehistoric waterfront, a major concentration of marten bones (Stopp, pers. comm.) apparently indicates pelt processing in the lakeshore area. This observation was supported by our recovery of quantities of small, so-called Type 1/7 (Schibler 1981) bone points (Bartosiewicz and Choyke 1997), which may have served as pegs used in stretching and pinning skins being dried (Nelson 1973:222). If these points had anything to do with this activity, they were most probably deposited (along with bones of the discarded carcass) during the autumn which is the most favourable time for both trapping and fur hunting (Trolle-Lassen 1987:87).

While the smell of a few drying pelts would not deserve mention, numerous red deer metacarpal and metatarsal remains in the same, southern excavation block at this site suggest that they may have been removed from deerskins here. Modern Age iconographic evidence of this technique may be seen in the foot bones depicted as being left in a deer hide in Albrecht Dürer's design for Maximillian's triumphal arch (Kurth 1963:284–285). Winds along the lakeshore would have facilitated the drying of animal skins and also taken care of the eventual smell. Another form of Neolithic 'smell control' may have been provided by the lake itself, in which the pile dwellings stood. The actual location of these dwellings vis-á-vis the water has been debated: it is unknown whether they stood in the water, by the water or whether their lacustrine status depended on the actual state of the changing water levels. Presuming, however, that the ground below the houses was inundated to any extent, the cold water of the Alpine lake may have reduced the smells from all forms of refuse. This is not to say, however, that sanitation was an explicit priority when Neolithic pile dwellings were laid out.

Shell processing

The Levantine coast of the eastern Mediterranean may be considered the centre of the dyeing industry in the ancient world. The production of purple dye, mastered by the Phoenicians, is known from classical sources, most notably Pliny the Elder (*Natural History*; relevant references include: V, 19; VI, 201; IX, 60–64; XIV, 12; XXVI, 20; XXXV, 44–45; XXXVII, 62).

Both the 'Royal Purple' dye and the closely related 'Biblical Blue', *tekhelet*, were obtained at the end of a technological process that produced smells, most abominable by modern standards. Tekhelet was of major ritual significance for ancient Jewry. It was extracted from its animal source, the banded murex snail (*Trunculariopsis [Murex s. Phyllonotus s. Hexaplex] trunculus*) by crushing the live animals. 'The vein (hypobranchial gland) is removed . . . and to this salt has to be added . . . three days is the proper time for it to be steeped, and it should be heated

in a leaden pot . . .' (Pliny, *Natural History* IX, 61). The process also includes treatment with quicklime and subsequent buffering with urine. The resulting *dibromindigo* is transformed into *indigo* when exposed to ultraviolet light. Indigo belongs to a group of combined ring organic compounds, and is an oxidated form of the aforementioned smelly substances, indol and scatol (Gróh 1943:159–160). Strabo (*Geography* XVI, 2, 23, 575), in describing Tyre and its dye factories, made a special reference to their repulsive smells.

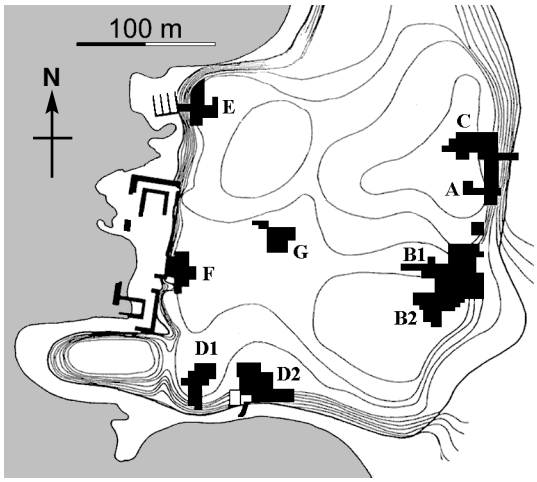

Figure 5. *Site plan of Tel Dor with excavated areas (D1 and D2 in the south are discussed in the text).*

Remains of a 4th-century AD *tekhelet* workshop came to light in area D1 at the ancient port of Tel Dor (Fig. 5), south of Haifa in Israel. In addition to processing pits and a plastered channel, layers of crushed shell were discovered in a building dated to the Persian period of the site.

Persian occupation, associated with these features fits within the relative chronology of the site as follows:

1. Pre-Iron Age (late Bronze Age, LBA)
2. Iron Age/Ia Sikil (pre-destruction, IA/Ia)
3. Iron Age/Ia Sikil destruction (IA/Ia)
4. Iron Age/Ib Phoenician (post-destruction, IA/Ib)
5. Persian occupation
6. Hellenistic rule

Although most animal bones from area D1 could be assigned to the Persian period, phases 2 to 6 were all excavated in neighbouring area D2. Research has reached deeper layers in this latter area, almost directly adjacent to D1 where shell processing took place (Fig. 6).

What is amazing about this facility, is that it seems to have been located in the immediate proximity of high-status residential areas in the city. The massive layers of crushed Murex shell in pits at fourth-century BC Tel Dor were found at the southern edge of the coastal settlement, not only upwind from the rest of the site, but practically adjacent to the so-called acropolis that stood there during the Persian Period (Ilan Sharon, personal communication). Since the value of purple dye rivalled that of gold per weight unit, the only conclusion could thus be that 'money had no smell', even in Antiquity.

This hypothesis has been tested by comparing refuse bone between

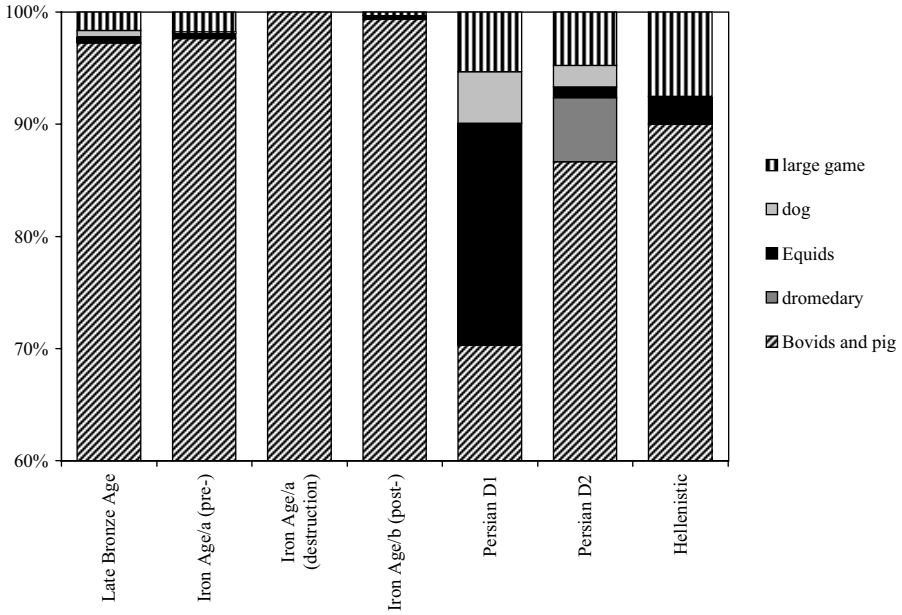

Figure 6. *Percentage contribution of bone fragments from major animal groups at Tel Dor.*

chronological phases in area D2, contrasting them to zoological finds in area D1. Bone fragments assigned to various animal taxa are listed in Table 3. In comparison with the various Iron Age strata, animal remains in the Persian layers show a remarkably high contribution of non-meat purpose animals such as beasts of burden (Equids, dromedary) and dogs (Fig. 6). The high concentration of bones from these latter animals in the area (rather than those from food refuse, typical of the Iron Age) indicates that it was probably less densely inhabited during the Persian occupation than in previous times. In fact, it may have served as a dumping ground for animal carcasses at a time when shell processing also took place nearby.

When divided into groups of large (cattle, deer, horse and so on) and small (sheep, goat, pig, gazelle and so on) animals, usually significant differences occur in the mean bone weights between these groups (Table 4). While Persian bones, especially those from large animals, are on average heavier than 25 g in area D2 (Fig. 7), great standard deviations in weight obliterate statistically significant differences between large and small animals characteristic of the other periods in area D2. This phenomenon could simply be attributed to different patterns of butchering during the Persian period. However, it is more characteristic of haphazardly dismembered animal carcasses (often in secondary positions) than of ordinary food refuse.

According to Karmon and Spanier (1987:149), at the majority of analogous sites in Israel, purple dyeing installations were located on the eastern edge of the settlement, since the prevailing winds are westerly for most of the year. A major

Table 3. The number of identifiable bone specimens in various phases of area D2 at Tel Dor, compared with the Persian period sample from area D1 (LBA= late Bronze Age, IA= Iron Age)

	LBA	IA/Ia (pre-)	IA/Ia (destruction)	IA/Ib (post-)	Persian D1	Persian D2	Hellenistic
cattle	42	426	89	134	129	40	17
sheep	30	210	16	27	7	6	1
goat	8	79	16	10	4	7	
sheep/goat	97	1092	204	136	48	29	17
pig		7		2	11	9	1
dromedary						6	
horse		1		1	26		
donkey	1	6			14		1
Equid		2			16	1	
dog	1	2			13	2	
red deer		10			3		1
fallow deer		7		1	2	3	
gazelle	2	14			5	1	1
wild boar	1	2			5	1	1
large ungulate	35	329	97	79	75	24	8
small ungulate	29	489	73	101	9	33	4
Total	246	2676	495	491	370	162	52

accumulation of crushed dye-producing shells was found some 500 m south of Tel Shiqmona on the North African littoral, where winds would have blown from the north, although a few such mollusc remains also occurred within the Iron Age settlement itself (Karmon and Spanier 1988). They concluded that special efforts must have been made to locate the large installations according to the prevailing wind, so that the bad smell would be carried away from the habitation area. Another possibility was that purple dye was produced on a small-scale by households, for example at the Middle Bronze Age tell of Ayios Mamas near the Aegean coast in Greece (Becker 2001:123). In small concentrations, the obnoxious smell of rotting shell would have just blended in with other smells at the settlements. At Tel Dor, a 'shift in smells' is indicative in a radical shift in settlement structure (from habitation to waste disposal area) in the area concerned.

Table 4. Comparison between bone fragment weights by period (IA= Iron Age)

	Large mammal			Small mammal			Parameters		
	n	mean	s. d.	*n*	mean	s. d.	*t*-value	df	*p*
1 Late Bronze Age	66	16.0	19.3	117	7.2	7.5	4.377	181	0.000
2 IA/Ia (pre-)	531	18.0	18.6	1188	7.6	7.0	16.729	1717	0.000
3 IA/Ia (destruction)	118	15.9	19.3	207	5.5	5.0	7.383	323	0.000
4 IA/Ib (post-)	145	17.2	27.0	172	6.1	6.1	5.233	315	0.000
5 Persian D1	267	31.0	26.3	100	8.8	10.7	8.171	365	0.000
6 Persian D2	53	41.3	100.3	58	23.1	118.8	0.865	109	0.389
7 Hellenistic	19	20.8	20.9	17	4.8	4.4	3.098	34	0.004

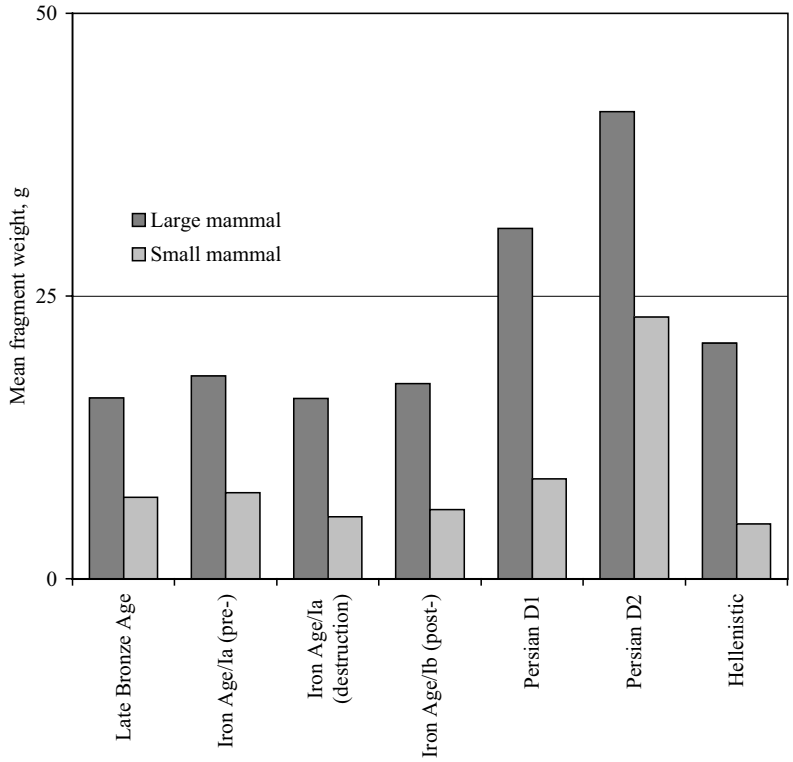

Figure 7. *Comparison of mean fragment weights by period at Tel Dor.*

General considerations

In addition to the specific situations illustrated by the aforementioned case studies, two major sources of bad smells must have been omnipresent at many ancient settlements. They are most widely discussed in the taphonomic description of many archaeological sites, therefore only a brief review is provided here.

Binford's (1978:213) ethnographic observations of *meat processing and carcass disposal* show concern with smells. He noted, among other things, that Nunamiut reindeer carcass processing areas in Alaska were located between the kill-site and the residential area in order to minimize the attraction of flies and reduce the smell in the spring habitation. Cadaverine, $H_2N(CH_2)5NH_2$, a toxic diamine resulting from protein hydrolysis, and putrescine, $H_2N(CH_2)4NH_2$, a related compound produced by decaying animal matter must have been the dominant features in this olfactory scenario. A similar spatial isolation of a primary cattle butchering site was described at an eighth–tenth century AD rural settlement of sedentary pastoralists in Hungary (Bartosiewicz 1988). At some urban settlements, the disposal of concentrated animal waste was carefully controlled. Ancient Jewish laws forbade the slaughter of animals in the open, and a need for designated slaughtering areas is emphasized in subsequent periods as well (Weissenberg

1951:77). A linguistic relict in Hungarian pointing in this direction is the term for slaughterhouse, *vágóhíd*, which literally translates as 'slaughter bridge', expressing the importance of (running) water in the mass-processing of carcasses. Late Roman period waterside dumps in Lincoln contained quantities of cattle bone. They have been interpreted as butchering waste, regularly collected at various *loci* and systematically deposited in a landfill on the bank of the river (Dobney et al. 1996). Both the water and breeze may have eased the environmental impact of these animal remains. In addition to the consolidation of the riverbank fill (Dobney et al. 1996:20), the rapid reburial of these bones may be explained by an effort to seal them prior to further decay. Since Pope Gregory III banned horseflesh eating in the Christian world in AD 732, the processing of dead horses in towns was increasingly left to flayers or knackers, who often acted as executioners as well. Such a specialist in 'death and decay' was typically marginalized in every respect, living in the periphery of settlements, practising his grim and odiferous trades.

The remains of executed people are sometimes found together with those of horses and dogs, as was the case in the boneyard in the outskirts of Luzern (Switzerland), used between the sixteenth century and 1869 (Stampfli 1990). An iconographic parallel is the scatterings of both human and horse bones on the way to Calvary, as depicted by Pieter Bruegel the Elder in his painting *Carrying the cross* (Kunsthistorisches Museum, Wien). Although not intended as documentation of sixteenth-century carcass-disposal practices in Flanders, details in this picture were probably inspired by the contemporary urban landscape. In addition, the ominous presence of crows in the picture is an indication that it was not for nothing that these commensal birds quickly found a niche in early urban environments (Gál 2003:121): they were attracted by the concentration of the same substances that must have been sources of, to say the least, robust smells. This may also lie behind the fact that the meat of the carrion crow (*Corvus corone* L. 1758) is usually avoided (Gréczi-Zsoldos 2003:9).

Frequent marks of dog gnawing on archaeological bone finds offer clear evidence of *scavenging*. They show that these animals indeed contributed to keeping residential areas clean. Whether they were consciously kept for this purpose (a very modern concept), or whether they just co-existed alongside the human population as commensal pariah dogs, probably varied with individual situations. Scavenging, however, must have contributed to the negative aspect of the distinctly dualistic image of dogs in the ethnolinguistic record (Bartosiewicz 1998).

Although dogs themselves smell, they do not even compare to pigs. Evidence of pig gnawing is also detectable in archaeozoological assemblages (Greenfield 1988), and widespread pig scavenging is substantiated by both ethnographic and historical data. In New Guinea, pigs fit within the *Tsembaga* subsistence system by eating garbage and human faeces, thereby converting wastes to the benefit of their masters (Rappaport 1973:58). This idea works in rural settlements, where the concentration of neither humans nor animals is too great to cause inconvenience, including obtrusive smells. Urban centres, however, vary in this regard. In the Altstadt of Frankfurt am Main, pig keeping was banned in 1481, as unworthy of a

great city (Pounds 1974:278). On the other hand, in eighteenth-century New Amsterdam (USA), privies opened to the street so that roaming pigs might 'consume the filth' (Peterson 1917:94). Tolerance of human faeces, however, varied. Roman towns in Britain, for example, seem to have been kept rather clean, while human parasite eggs in Anglo-Scandinavian and medieval York are indicative of dispersed faecal material (Dobney et al. 1999:20). In the early 1800s, offal in some North American cities was so abundant that country folk sent their pigs to town 'for bed and board, especially in the springtime when the streets have thawed' (Scott 1952:62). Aside from the smell of the pigs themselves, one can imagine the stench and sanitary conditions under which this solution was chosen. In contrast to cattle, cited in the Vác example (where archaeological evidence coincides with the animals' massive, documented presence), a great contribution of pig remains means only pork consumption, rather than scavenging. The latter is best represented by the remains of non-meat purpose dogs (and their gnawing marks) in archaeozoological assemblages.

In quantitative terms, gnawing marks by cats (Moran and O'Connor 1992:27) and rodents are less significant, although these animals would also have been part of the broader, smell-producing scavenging scene.

DISCUSSION

While it would be erroneous to suggest that bad smells acted as a driving force in human cultural history, archaeological case studies listed in this article are intended to represent scenarios in which robust smells (in this case related to animals) could not have been avoided. Admittedly, however, these situations represent extremes; the reconstruction of the roles delicate smells must have played would be an even more complex and almost impossible task.

As opposed to that of dogs, whose brains are continuously processing scent information, the inert human olfactory system does not 'read' smells actively. In other words, we can get accustomed to even a heavy stench in a relatively short time. As Ezra Zubrow pointed out during the discussion following the original presentation of this article, cowboys working in cattle yards in the US hardly ever noticed the heavy smell of thousands of cattle that he found rather obtrusive arriving 'freshly' from the outside. In this sense, it is worth distinguishing between acute or dynamic smells (that carry new information and influence human decisions) and chronic or static smells (a constant and unavoidable part of the cultural landscape). Examples cited in this article, best supported by cumulative archaeological evidence, fall within the latter category.

Meaning, however, varies by context (Alexandri 1995:67), therefore the problem under discussion here is worth summarizing in at least two main dimensions: the message of smells within and between cultures.

Intra-cultural aspects of smell

Within cultures, it must have been the quantity, i.e. concentration of well known

and somewhat tolerated smells that probably made the greatest difference. With the emergence of urbanism and increasing concentrations of human population in 'western' culture, the unpleasant issues of death and decay have been increasingly delegated to various specialists. The aforementioned flayers and knackers (a 'despicable person' in contemporary Irish slang), for example, were usually disreputable members of the community. Their job, by definition, included having to live with the related smells. Polite society therefore has been gradually isolated from many of the unpleasant smells, evidence for which can at least indirectly be detected in the archaeological record. The discomfort caused by a bad smell thus has deeper, social implications. The inferior status of dealing with dead animals is not limited to European culture. In India, for example, *Dalit* people in the pariah caste are in charge of, among other onerous tasks, the skinning of animal carcasses.

In addition to distinctions by social hierarchy, gender-related attitudes to dirt have been discussed by Moore (1986) as part of the relationship between the organization of household space in the vicinity of round houses among the Marakwet in modern Kenya. Her analysis, both economic and symbolic, focused on social and economic conditions that produced and maintained spatial organization. These patterns were not only gender-related, but also changed diachronically with modernization. While, aside from the recovery of perfume bottles (e.g. Costello 2000:168, Figs 9.4/a and c), gender aspects of smell seem to be most intangible by direct archaeological means, one may presume that the role of bad smells (not a special focus of Moore's study), has also been subject to perpetual change within society.

Inter-cultural aspects

The best-documented references to culturally idiosyncratic attitudes to smells can be found in the sometimes shocked accounts of early Modern Age travellers, such as John K. Townsend. He reported on the mid-nineteenth century native inhabitants along the Columbia river in North America (Townsend 1970:258, 261): '. . . as I entered the village, my olfactories were assailed by the most vile and mephitic odors, which I found to proceed from great piles of salmon entrails and garbage . . . rotting . . . *around the very doors of habitations* . . . although I had been a time considerable estranged from the abodes of luxury . . . was glad to escape to a purer and more wholesome atmosphere.' (my emphasis). More interesting than the technical description of these smells is the vehemence with which this unquestionably tough explorer complains about how unbearable they were. Many prehistoric sites in Europe would probably evoke similar emotions in a contemporary time traveller. For example, the narrow alleys of the late Neolithic tell site of Berettyóújfalu-Herpály in eastern Hungary, especially at the time of Level 8, when the settlement was most densely inhabited (Kalicz and Raczky 1987:108), were packed with a layer of animal bone refuse nearly 50 cm thick. It would be naïve to presume that these bones had been deposited dry and clean.

A variety of emotions can be associated with smells. It is therefore, similarly to the role of touch, a significant dimension of the human experience, both in

interpersonal and person–environment relationships (Rodaway 1994:41). Equestrian nomads must have, among other things, smelled rather like horses, while sedentary agriculturalists tending pigs and cows probably represented a very different olfactory domain. It must be hypothesized that the hierarchy of early Modern Age pastoral castes in Hungary, with the renowned *csikós* (horseherds) on top and pigherds at the bottom, was also influenced, to some extent, by their animals' smell. The smell of horse manure, in a class of its own, has been well tolerated in most western cultures. This favourable attitude is probably rooted in the animal's high status. Horses are usually also kept cleaner than other domesticates.

It is almost unimaginable that when and if differences in smell coincided with ethnic/cultural or the aforementioned social boundaries, they would have gone unnoticed, rather than reinforcing distinctions based on a number of visible or linguistic/social traits. In fact, references to the (true or imagined) smell of certain groups of humans are a staple in the crudest of ethnic jokes, and in the most appalling cases, form an integral part of racist stereotyping.

CONCLUSIONS

Human beings have a limited physiological capacity for processing olfactory information. In addition, the adaptive capability of human culture can, within limitations, attach positive or negative notions to certain smells, thereby making them acceptable or even desirable. Between these two traits, it is plausible to assume that certain smells, even if robust, would have remained unnoticed in communities that had no choice but living with them. On the other hand, there is archaeological evidence that consideration was given to the heaviest smells, and relevant arrangements are reflected in settlement structure.

Regrettably, the crude archaeological record has seldom preserved comparable information on more delicate scents, especially those related to ancient human metacommunication. It must be hypothesized, however, that while sensing smells was probably one of the main abilities sidelined by civilization, subtle, culturally idiosyncratic associations have constantly played an important role in shaping human behaviour. Smells do have a meaning, way beyond the consciously sought-after nose of a first class wine.

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The woodcut in Fig. 3 was reproduced with the permission of the Nationalmuseum in Nürnberg.

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ABSTRACTS

'Il y a quelque chose de pourri dans le royaume . . .': Puanteurs dans l'antiquité
László Bartosiewicz

Les odeurs ont une très grande importance dans la vie de tous les jours. Ils nous apportent des informations sur l'environnement et évoquent des associations. Cependant, l'archéologue ne peut étudier les odeurs – comme beaucoup d'autres aspects de la vie d'autrefois – que indirectement. Dans cet article, on examine les restes organiques provenant d'exploitation animale sur différents sites préhistoriques, classiques et médiévaux. Après l'identification de l'origine des odeurs nauséabondes, on analyse leur distribution par rapport aux vents prédominants et à la structure du village. Les attitudes particulières de chaque culture envers les «mauvaises» odeurs sont également évaluées.

Mots clés: odeurs, pourriture, vents prédominants, tannerie, teinture pourpre, commerce du bétail et des animaux de basse-cour

'Etwas ist faul im Staate . . .': Schlechte Gerüche in der Antike
László Bartosiewicz

Gerüche spielen eine große Rolle im Alltagsleben: Sie enthalten Informationen über die Umwelt und rufen Assoziationen hervor. So wie viele andere Aspekte der Vergangenheit können Gerüche in der Archäologie jedoch nur indirekt rekonstruiert werden. Dieser Artikel untersucht organische Rückstände von Tiernutzung an verschiedenen Stätten (prähistorische, klassische und mittelalterliche gleichermaßen). Die Geruchsquellen wurden anhand der tierischen Überreste

identifiziert und anschließend unter Einbeziehung anhaltender Windrichtungen und Siedlungsmuster untersucht. Kulturell bedingte Verhaltensunterschiede gegenüber schlechten Gerüchen werden ebenfalls diskutiert.

Schlüsselbegriffe: Gerüche, Verwesung, anhaltender Wind, Gerberei, Purpur, Viehhandel

'Valami bûzlik . . .': Rossz szagok a múltban
László Bartosiewicz

A szagok rendkívül fontosak mindennapi életünkben. Ismereteket közvetítenek környezetünkről, képzettársításokat keltenek. A régészetben azonban – a múltbeli élet más vetületeihez hasonlóan – a szagokat csak közvetve tanulmányozhatjuk. Ebben a tanulmányban az állatok hasznosításának szerves maradványaiból indulunk ki különböző (oskori, klasszikus és középkori) lelőhelyeken. A szagok forrásának azonosítása után azok terjedését az uralkodó szélirány és a településszerkezet összefüggéseiben vizsgáljuk. Szó esik a rossz szagok kulturálisan eltérő megítéléséről is.

Kulcsszavak: szagok, bomlás, uralkodó szélirány, tímárkodás, bíborfesték, élőállat-kereskedelem