# ARCHAEOZOOLOGY OF THE NEAR EAST IV B

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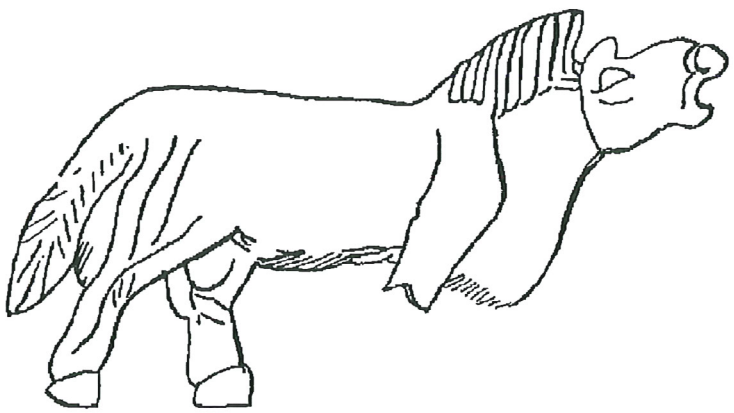

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Przewalski from Susa (nacre – mother of pearl)
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## VOLUME B

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VOLUME A

# HUNTING WITH BOW AND ARROW AT TELL SABI ABYAD

Chiara Cavallo[1], Peter M.M.G. Akkermans[2] and Hans Koens[3]

Abstract

Faunal as well as archaeological material found at Sabi Abyad provides evidence of hunting with bow and arrow. This hunting technique was applied to different kinds of game and was probably the most common technique used. The relative importance of hunting within the site's economy is presented as well.

Résumé

Les témoignages fauniques et archéologiques à Sabi Abyad mettent en évidence la chasse à l'arc et à la flèche. Cette technique était utilisé dans la chasse de différents gibiers et constituait sans doute la méthode la plus courante sur le site. L'importance relative de la chasse dans l'économie de subsistance du site est aussi examinée.

**Key Words**: Neolithic, Hunting, Scanning Technique

**Mots Clés**: Néolithique, Chasse, Techniques de scanographie

## Introduction

During the 1991 excavation campaign at Tell Sabi Abyad, situated in the upper Balikh valley in northern Syria, an almost complete bovid shoulder-blade was found with the remains of a flint implement still embedded in its blade. The specimen was recovered in secondary deposits from one of the houses of the 'Burnt Village', so called because of its destruction in a conflagration (Akkermans and Verhoeven 1995). The Burnt Village corresponds to Level 6 of the long sequence of late Neolithic occupation and is dated to 5250/5200 bc, uncalibrated (Verhoeven and Kranendonk 1996) or ca. 6000 BC, calibrated.

## Description of the specimen

The find consists of an almost complete bovid scapula (Fig. 1). Most of its fractures are due to recent damage or post-depositional processes. Owing to these the spine and a large part of the blade are missing. The flint implement is partly embedded in the proximal part of the blade, close to the caudal border on the lateral side of the scapula and the lesion did not reach the medial part of the bone (Figs. 2 and 3).

## Identification

In the case of the shoulder-blade in question there is no doubt about its identification. The presence of the flint implement confirms that it obviously belongs to a large wild bovid, the aurochs (*Bos*

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Fig. 1. Aurochs shoulder-blade from Tell Sabi Abyad

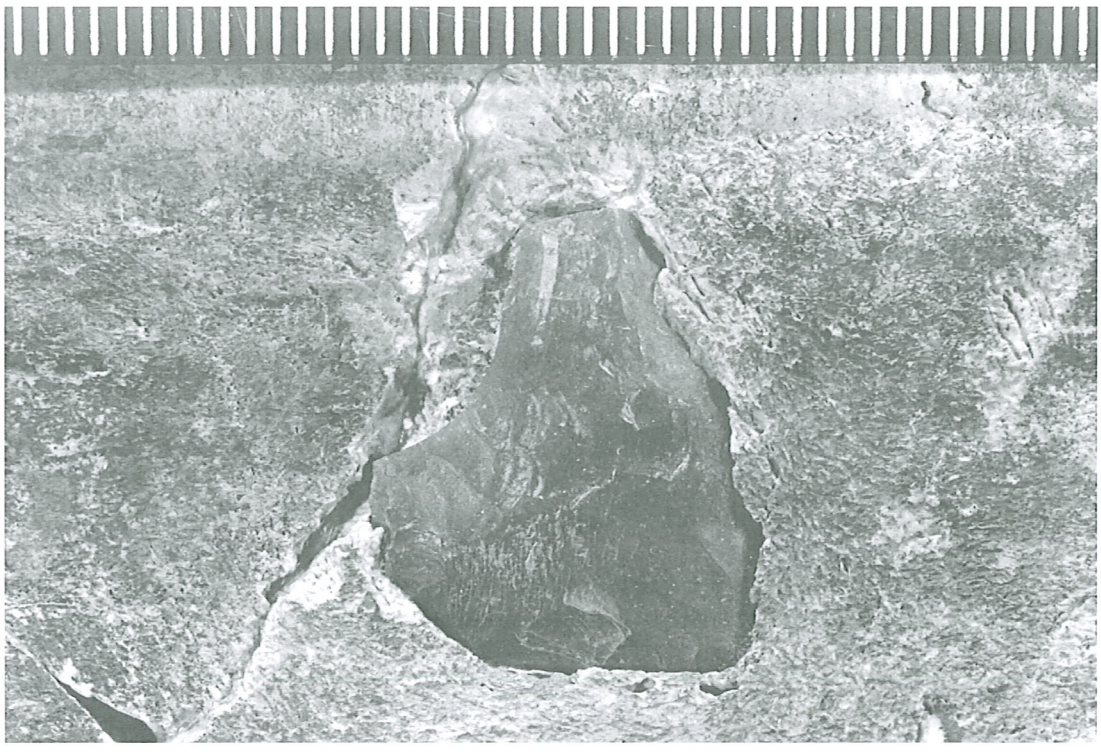

Fig. 2. Detail of the flint implement embedded in the blade of the scapula from Tell Sabi Abyad

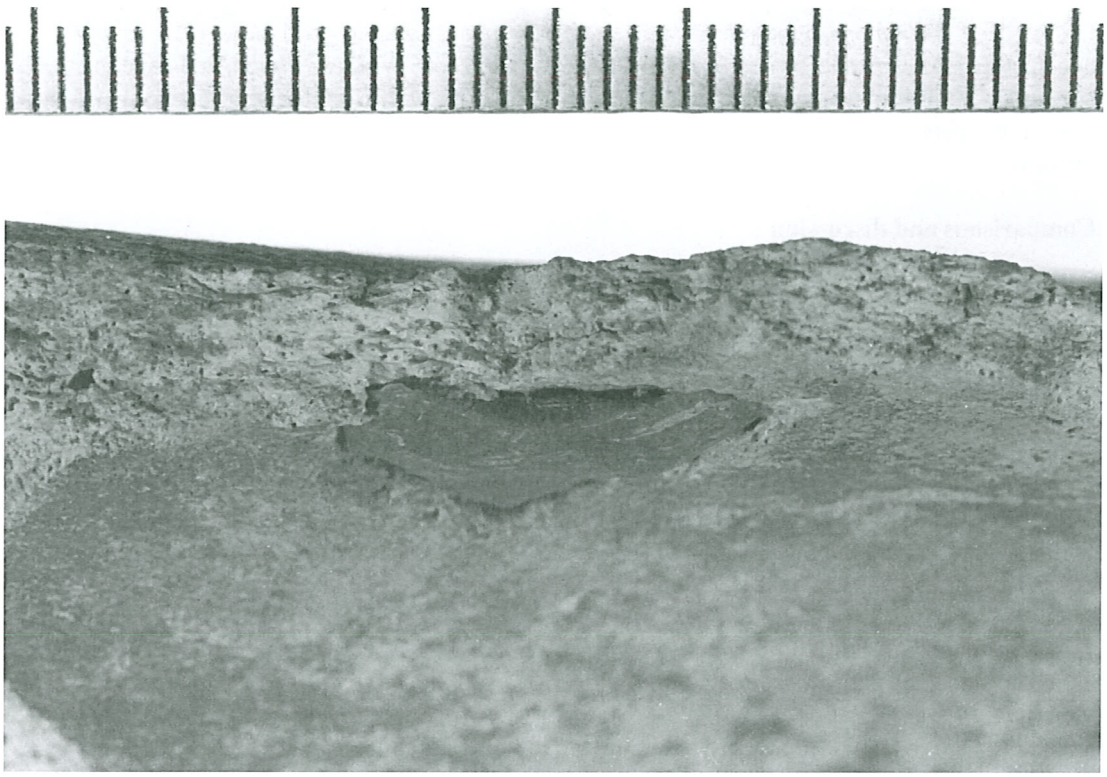

Fig. 3. Detail of the flint implement embedded in the blade from the scapula from Tell Sabi Abyad

Table 1. Measurements of bovid scapulae from Tell Sabi Abyad
(after Von den Driesch 1976)

| Specimen | SLC | GLP | LG | BG | | |
|---|---|---|---|---|---|---|
| SAB88 P15 23.38 | 55.9 | 71.4 | 61.1 | - | domestic | Cavallo 1997 |
| SAB88 R13 28.103 | 69.1 | 82.8 | 70.4 | - | wild* | Cavallo 1997 |
| SAB91 R12 33.60/4 | 72.0 | 88.0 | 72.3 | 62.5 | wild | present study |
| SAB91 Q13 112-295/1 | 51.5 | - | - | - | domestic | worked (level 6) |
| SAB88 Q13 10-59/1 | 54.8 | - | - | - | domestic | worked (level 6) |

* this specimen was previously only tentatively identified as wild

*primigenius*). Although the measurements of shoulder-blades available from Sabi Abyad are few so far, the size of the specimen supports the identification of aurochs as well (Table 1). This special find also allowed the positive identification of a specimen of *Bos primigenius* tentatively identified as such in the previous stage of the research in the faunal material from the site (Cavallo 1997).

The aurochs is, in general, scarcely represented in the faunal material of Sabi Abyad. Thirty-two specimens at least were found, making up about 10% of the wild species, which are largely dominated by gazelle (*Gazella subgutturosa*) and onager (*Equus hemionus*) (Cavallo 1993, 1997).

Other minor species are present: wild sheep (*Ovis orientalis*) and wild goat (*Capra aegagrus*), fallow deer (*Dama mesopotamica*), red deer (*Cervus elaphus*), wild boar (*Sus scrofa*), striped hyaena (*Hyaena hyaena*), brown bear (*Ursus arctos*), red fox (*Vulpes vulpes*), and cape hare (*Lepus capensis*). Hunting in any case plays only a small role within the general economy of the Sabi Abyad, the percentage of wild animals varying between ca. 5% to 3% of the total identified mammal remains.

**Comparisons and discussion**

The shoulder-blade in question represents a quite unique specimen for the Middle East and for the Neolithic period. So far, the nearest parallel was found in the shoulder-blade of a bison from the Ukranian Upper Palaeolithic which had been pierced with a dart head made from reindeer antler (Vereshchagin 1967, Fig. 9), while most of the evidence for injuries on the shoulder-blade similar to that from Sabi Abyad comes from northwestern European sites. The best known are those from Mesolithic or isolated peat bogs in Denmark: at Grænge Mose a shoulder-blade of an aurochs was found which was reported to have an unhealed fracture in the form of an oval hole in the middle of the blade, while an unhealed fracture was present on the scapula of the almost complete skeleton of an aurochs found in the preboreal bog of Vig (Noe-Nygaard 1974: 221, 220). Injuries on various shoulder-blades, as well as on other skeletal elements of reindeer, such as the humerus, vertebrae and especially ribs with unhealed fractures, were found at the northern German site of Stellmoor (Rust 1937, 1943). In many cases flint fragments were still found in the bone as well (Bratlund 1991). Likewise, at Star Carr in England, two shoulder-blades of elk (*Alces alces*) and red deer (*Cervus elaphus*) with lesions due to healed injuries were found (Noe-Nygaard 1975). Finally, in a much later period, i.e. 7th/10th centuries AD, an injured shoulder-blade of an old stag was found at Lagore in Ireland (van Wijngaarden-Bakker 1981).

These examples show that the hunting techniques used in different areas and periods were obviously strongly dependent on the anatomy of the animal. Ethnographic and historical studies confirm that the search for the best point of impact is the main aim of hunters, despite different hunting techniques in different human communities (Ducateau and Vigne 1993). For killing the animal the weapon must in fact reach vital organs, such as the throat artery, lungs, and spinal cord. Hitting these parts would result in a fatal wound, causing the instant death of the animal. The upper part of the shoulder-blade is above this 'fatal' region, and healed fractures grouped around the dorsal margin of the scapula would indicate therefore that the animal survived since no vital organs lie underneath (Noe-Nygaard 1974: Fig. 22). The scattering of healed and unhealed fractures, or in other words 'fatal or non-fatal wounds', on the shoulder-blade would also be the consequence of animal behaviour as well as of specific hunting techniques (Noe-Nygaard 1974).

The ecology and the distribution of aurochs in the ancient Near East is poorly known. Aurochs is supposed to have been a rather adaptable animal, able to live in the forest as well as in more open country (cf. the discussion to the article by Payne 1982, pp.140-142). In spite of its preference for grassy environments it was able to feed on more shrubby plants as well. In this sense aurochs can be considered a mixed feeder. If even in the most humid climatic areas cattle can include shrub vegetations in certain periods of the year (Putman 1987: Fig. 52; Bokdam 1987: Fig. 40), this must have been especially true in the Near East, where lush vegetation was mainly confined to the areas along the rivers and the wadies. In the Balikh Valley, the aurochs most probably lived in small populations in an area enclosed between the border of the steppe and the more humid areas along the river Balikh where a riverine forest of poplars, willow shrubs, tamarisks and dense reed beds constituted the natural vegetation (Van Zeist *et al.* 1988; Gremmen and Bottema 1991: 106). These areas with greater cover could have given hunted animals easier shelter in case of attack. At other late Neolithic sites aurochs were found along the middle Euphrates at Shams ed-Din and at Tell Turlu, and on the upper part of the Tigris at Girikihaciyan (Uerpmann 1982; Ducos 1991; McArdle 1990). Although available in very small numbers, these finds attest the distribution of the aurochs in northern Syria and southern Turkey during the 6$^{th}$ and 5$^{th}$ millennia bc (uncalibrated), while at two other contemporary sites in northern Iraq, Yarim Tepe II and Arpachiyah, no bones of aurochs were identified (Bibikova 1981; Watson 1980).

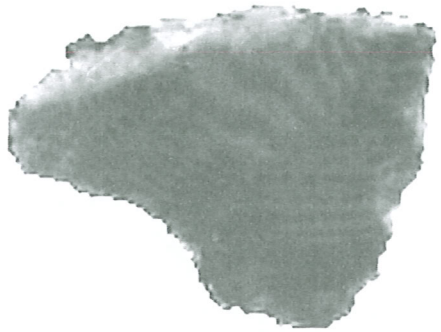

Fig. 4. Reconstruction of the outline of the flint implement using Computed Tomography Scanning

The study carried out on the other wild species hunted at the site, in particular on the type of birds and on the mortality patterns of gazelle, indicates that hunting at Sabi Abyad was most likely concentrated in the autumn-winter months, a period in which the herds were larger and gathered within a limited territory, probably requiring cooperative hunting.

A clue to understanding the kind of weapon and hunting technique used at Sabi Abyad comes from the analysis of the type of flint tool embedded in the bone. For this reason a special scanning technique (Computed Tomography Scanning) was applied in order to reconstruct the complete original outline of the implement (Fig. 4). This turned out to be a small thin triangular arrowhead, known as the Haparsa Point type. This type of arrowhead was found in small numbers in other contexts at Sabi Abyad, although it is mainly known from desert sites in the southern Levant and the Arabian peninsula (Copeland 1996). The tang is missing, broken during the attempt to remove the weapon from the body of the animal. The sections made by the scanning technique allowed us to establish that the flint had partly penetrated the bone as a result of a powerful shot and that no regeneration of the bone actually occurred, as the profile of the fracture of the bone is still 'freshly' sharp (Fig. 5). A deeper penetration of the flint towards the lateral side of the shoulder-blade, transversally to the bone, indicates that the shot came from the front somehow and from above with respect to the animal. This could have been possible if the animal, after having been caught in an ambush or separated from the rest of the herd, was already lying on the ground, maybe surrounded by a group of hunters shooting from all directions, as the unhealed lesion (or missed shot) on the bone implies that another hit must have caused its death.

Of course, it cannot be completely excluded that the neolithic hunters of Sabi Abyad also used other techniques and weapons than the one described here. They may have used more perishable material such as wooden spears with fire-hardened points, nets, pitfalls, traps, or sun-dried clay sling missiles, found in large numbers at the site, and as ethnographic examples would suggest, probably used more for small game and birds (Ochsenschlager 1998: Fig. 9). Nevertheless, the effective result of a human shot on the aurochs shoulder-blade together with the iconographic evidence on a sherd representing two men holding a bow from level 3 (Fig. 6) and various types of arrowheads found at the site in different levels, strongly suggest that the use of the bow and arrow technique was a common hunting method pursued at Sabi Abyad throughout the long late Neolithic occupation of the site.

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## References

Akkermans, P.M.M.G. and M. Verhoeven, 1995. An image of complexity: the Burnt Village at late Neolithic Sabi Abyad, Syria. *American Journal of Archaeology* 99(1): 5-32.

Bibikova, V.I., 1981. Husbandry in northern Mesopotamia in the 5th millennium B.C. (As based on the data from the Halaf settlement Yarim Tepe II). In: R.M. Munchaev and N.J. Merpert (eds.), *Earliest agricultural settlements of northern Mesopotamia*. Moscow, Nauka: 299-307.

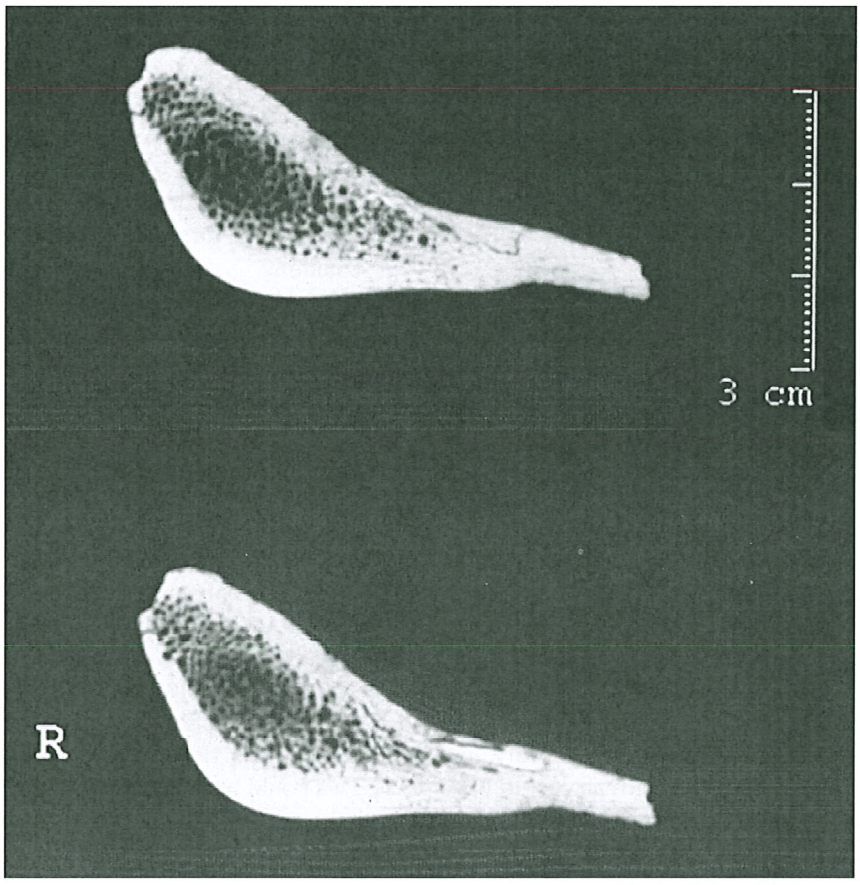


Fig. 5. Profile of the scapula and the flint implement (Computed Tomography Scanning)

Fig. 6. Sherd from Tell Sabi Abyad with archers

Bokman, J., 1987. Foerageergedrag van jongvee in het Junner Koeland in relatie tot het voedselaanbod. In: S. de Bie, W. Joenje and S.E. van Wieren (eds.), *Begrazing in de natuur*. Wageningen, Pudoc: 165-186.

Bratlund, B., 1991. A study of hunting lesions containing flint fragments on reindeer bones at Stellmoor, Schleswig-Holstein, Germany. In: N. Barton, A.C. Roberts and D.A. Roe (eds.), *The late glacial in north-west Europe: human adaptation and environmental change at the end of the Pleistocene*. London, Council for British Archaeology Reports 77: 193-206.

Cavallo, C., 1993. The role of hunting at Tell Sabi Abyad, a Later Neolithic settlement in northern Syria. In: F. Audoin-Rouzeau, J. Desse and J.-D. Vigne (eds.), *Exploitation des animaux sauvages a travers le temps*. Juan-les-Pins, Éditions APDCA: 275-277.

Cavallo, C., 1997. *Animals in the steppe - A zooarchaeological analysis of late Neolithic Tell Sabi Abyad*. Amsterdam, The University of Amsterdam (Ph.D. dissertation).

Copeland, L., 1996. The Flint and Obsidian Industries. In: P.M.M.G. Akkermans (ed.), *Tell Sabi Abyad - The Late Neolithic Settlement*. Leiden/Istanbul, NHAI: 285-338.

Ducos, P., 1991. La faune de Tell Turlu (Turquie) et les animaux domestiques dans la culture de Halaf. *Akkadika* 72: 1-19.

Driesch von den, A., 1976. *A guide to the measurement of animal bones from archaeological sites*. Harvard, Peabody Museum Bulletin 1.

Ducateau C. and J.-D. Vigne, 1993. Choix de la région anatomique visée lors de la chasse aux grands mammifères: mèthode et corpus ethno-archéologique. In: L. Bodson (ed.), *L'histoire de la connaissance du comportament animal*. Liège, University of Liège: 79-94.

Gremmen W.H.E. and S. Bottema, 1991. Palynological investigations in the Syrian Gazira. In: H. Kühne (ed.), *Die rezente Umwelt von Tall Seh Hamad und Daten zur Umweltrekonstruktion der Assyrischen Stadt Dur-katlimmu*. Berlin, Reimer: 105-116.

McArdle, J., 1990. Halafian fauna at Girikihaciyan. In: P.J. Watson and S.A. LeBlanc (eds.), *Girikihaciyan - A Halafian site in southeastern Turkey*. Los Angeles, Monograph 33 of the Institute of Archaeology, University of California: 109-120.

Noe-Nygaard, N., 1974. Mesolithic hunting in Denmark illustrated by bone injuries caused by human weapons. *Journal of Archaeological Science* 1: 217-248.

Noe-Nygaard, N., 1975. Two shoulder blades with healed lesions from Star Carr. *Proceedings of the Prehistoric Society* 41: 10-16.

Ochsenschlager, E., 1998. Life on the edge of the marshes. *Expedition* 40(2): 29-39.

Payne, S., 1982. Faunal evidence for environmental / climatic change at Franchti cave (southern Argolid, Greece) 25,000 BP to 5,000 BP. Preliminary results. In: J.L. Bintliff and W. van Zeist (eds.), *Palaeoclimates, palaeoenvironments and human communities in the Eastern Mediterranean region in later Prehistory*. Oxford, British Archaeological Reports, International Series 133(i): 133-143.

Putman, R.J., 1987. Invloed van grote grazers in het New Forest. In: S. de Bie, W. Joenje and S.E. van Wieren (eds.), *Begrazing in de natuur*. Wageningen, Pudoc: 187-199.

Rust, A., 1937. *Das altsteinzeitlche Rentierjägerlager Meiendorf*. Neumünster in Holstein, Wachholtz.

Rust, A., 1943. *Die Alt-und Mittelsteinzeitlichen Funde von Stellmoor*. Neumünster in Holstein, Wachholtz.

Uerpmann, H.P., 1982. Faunal remains from Shams ed-Din Tannira, a Halafian site in Northern Syria, *Berytus Archaeological Studies* 30: 3-52.

Verhoeven M. and P. Kranendonk, 1996. The excavations: stratigraphy and architecture. In: P.M.M.G. Akkermans (ed.), *Tell Sabi Abyad - The late Neolithic settlement*. Leiden/Istanbul, NHAI: 25-118.

Vereshchagin, N.K., 1967. Primitive hunters and Pleistocene extinction in the Soviet Union. In: P.S. Martin and H.E. Wright, Jr. (eds.), *Pleistocene extinctions - The search for a cause*. New Haven, Yale University Press: 365-398.

Watson, J.P., 1980. The vertebrate fauna of Arpachiyah. *Iraq* 42: 152-153.

Wijngaarden-Bakker van, L.H., 1981. An old stag from Lagore, In: D. Ó Corráin (ed.), *Irish antiquity. Essays and studies presented to Professor M.J. Ó Kelly*. Cork, Four Courts Press: 78-81.

Zeist van, W., W. Waterbolk-van Rooijen and S. Bottema, 1988. Some notes on the plant husbandry of Tell Hammam et-Turkman. In: M.N. van Loon (ed.), *Hammam et-Turkman I*. Leiden/Istanbul, NHAI, Appendix 2: 705-715.