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Axe and adze, bow and sling: contrasts in early Neolithic Europe

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It has generally been admitted for over twenty years that Switzerland lay on the fluctuating frontier between two neolithic culture-provinces — the Western (Westische) and the Danubian (Donauländische) — both of which may have contributed to the formation of le néolithique lacustre. But Paret[1] has recently challenged this view and in effect denied the Western contribution; the lake-dwelling and Michelsberg cultures would according to him be due to Danubian peasants, driven from the löss lands by Sub-Boreal droughts. Here I propose to draw attention to two criteria, hitherto ignored, that help not only to support the orthodox view, but also perhaps to estimate the contributions of each party to the neolithic cultures of the Alpine region. The criteria are based on the handling of woodworking tools and on preferences for propulsive instruments.

Since Mercati first explained the stone implements once called by the learned, keraunia and by the ignorant „thunderbolts", „pierres à foudre" or „Donnerkeile", by reference to the hatchets of American Indians, they have been labelled „axes", „haches", „Beile" by archaeologists — naturally; for the axe has been the typical woodman's tool to Europeans for two or three thousand years. But the ethnographic evidence suggests that archaeologists have been too precipitate in adopting the term „axe". A more critical study of contemporary tribes who use, or recently used, stone implements for chopping and hewing reveals that the adze (herminette, Deichsel) is often more important than the axe. Indeed among the most celebrated „Stone Age" woodworkers of the 19th century the adze was almost exclusively used. The fine green stone blades of the Polynesians are almost exclusively adzes. In New Zealand axes were only used by a few tribes in the North Island.[2] On the North-west Pacific coast of America the use of „celts mounted as adzes" by the Amerinds has been described by competent observers,[3] but I have been able to find no reliable account of their use of stone axes. Among the Esquimaux „axes were unknown, but adzes were skillfully used for hewing and surfacing logs"[4] Even in New England, though early writers mention the use of stone „hatchets", the technical accuracy of their terminology may be questioned since axe-blades are less common than adze blades.[5]

To find reliable evidence for the use of stone axes one has to turn to peoples on a lower cultural level in South America,[6] Melanesia,[7] New Guinea[8] and Australia[9]. Of course for any finer carpentry an adze is almost indispensible, but the exclusive pre-

ference for this tool is evidently a distinctive trait in certain cultures. It is odd that exponents of the Kulturkreislehre, who have laid such stress on the methods of hafting Beile,[10] have seldom troubled to mention how they were used. In practice of course any celt could be used as an adze if mounted on a knee-shaft (Kniestiel) or with a sleeve (gaîne, Zwischenfutter) of wood or antler; Melanesians successfully convert a stone celt from an axe-head to an adze-blade by simply rotating the mount, and Africans do much the same with iron blades. But the converse is not true. The typical adze-blade is asymmetrical about its major axis — much more steeply curved or bevelled on one face than on the other. Used as an axe, such a tool would always cut askew. An axe-head should be symmetrical so as to cut straight each time. Hence some celts can be recognized as adze-blades by their profile alone (Fig. 1).

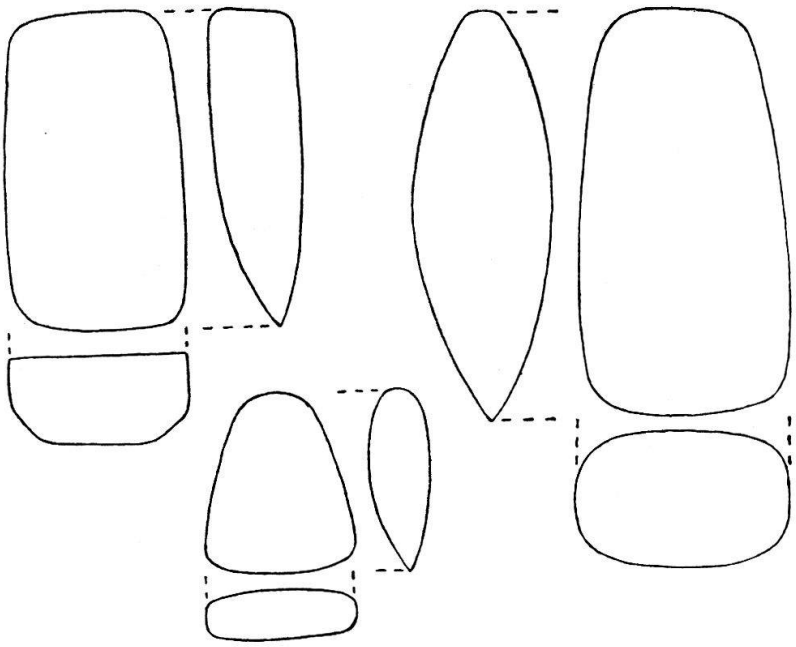


Fig. 1. Two typical adze-blades (left) and axe-head (right); from Deve-bargan, Bulgaria ($^2/_3$)

Archaeologists have been misled by their terminology into ignoring the clue thus furnished. The old English term „celt" had the advantage of being non-committal as to the implement's use. Its replacement by „axe" in the supposed interests of technical precision and to conform to Continental usage (hache, Beile, økse, ἀξίνη) has in fact led to the confusion of two tools that were handled in entirely different ways. At the same time the supposed chronological or chorological significance of the cross-section, has encouraged prehistorians to ignore the functional distinction and even to omit from their publications the evidence — the longtitudinal section — that would disclose it. (Nordic thick-butted celts with rectangular cross-section can quite easily be divided into axes and adzes — Pl. XXI, fig. 1). It is therefore seldom possible to assess statistically the proportion of adzes among the published celts from any given site or region. And, outside the debateable Alpine area, too few celts have been preserved in their wooden hafts to provide a significant sample.

In spite of all, sufficient evidence is available to establish a patent contrast between Western and Central Europe. West of the Alps, asymmetrical celts, unsuitable for use as axe-heads, are in a minority (save in Shetland on the one hand and the Iberian peninsula on the other). Of course adzes are essential for any fine carpentry. But in the Western province all surviving hafted celts — Blanquires de Labor (Murcia),[11] St. Nazaire (Brittany),[12] East Dean (Sussex),[13] Ehenside Tarn (Cumberland),[14] Solway Moss (Dumfries.),[14] Cookstown (Tyrone)[14] and Monaghan[15] — are in fact mounted as axes (though a perforated antler sleeve from Skara Brae, Orkney,[16] must have held an adze-blade). In any collection of celts from the British Isles the vast majority could have been used as axe-heads.[16a] Dechelette[17] has made the same observation on stone implements from France. This is, however, notoriously not true of the Iberian Peninsula. I have recently examined a large range of celts from Portugal: While in the north, 35 out of 38 celts preserved in the Museu Martins Sarmento at Guimarães could have served as axes, south of the Douro 26 out of 62 good specimens from Casa da Moura, 27 out of 58 from Cascaes, 15 out of 33 from Furninha, 6 out of 14 from Grotto 4 at Palmella[18] and 12 out of 25 from an „early" dolmen, recently excavated by Leisner[19] in Alemtejo can only be termed adze-blades. So in south-east Spain, adzes (Hacken und Keile) absolutely predominate over possible axes in the tomb-groups assigned by Leisner[20] to his earliest phase and are prominent in later assemblages.

East of the Alps on the contrary at least in early neolithic times axes seem to have been even rarer than in recent Polynesia. Notoriously the celts of the earlier Danubian cultures, defined by Spiralmaeander, Stichband, Rössen, and Hinkelstein pottery are asymmetrical about their major axes. They would accordingly be more suitable for use as hoe-blades in tilling the ground or as adzes in wood working. The prevalent assumption that all „shoe-last celts", despite the wide range of sizes known, the careful finish of many specimens and the trouble evidently taken to secure suitable material, were used in tilling the soil (as Hacke) has been refuted by Holtke[21] on ethnographic data. In fact specimens have been found mounted in antler sleeves[22] that can only have been used as adzes or chisels. At the same time the construction of substantial houses, as at Köln-Lindenthal and Goldberg I, presupposes efficient wood-working tools. But axes appear first — and then rarely and perhaps as weapons — in the Lengyel horizon (Tompa's Tisza culture, my Danubian II). So the earlier Danubian carpentry must have been done with the abundant adze-blades.

Further south in the Maros-Tisza-Körös region the celts of the Körös and Tisza (Tompa's Tisza II) cultures[23] and from the lower horizons of Tordos and Nandorvalya[24] seem exclusively adzes, and in the Balkans adzes again characterize the Starčevo and Vinča cultures[25] as well as Boian A and even Gumelnița. It is noteworth that even the flint celts of the „Bulgarian Mound culture"[26] that in cross section look so like Northern thick-butted axes, must really have been used as adze (or hoe) blades. Finally in Peninsular Greece the typical celts associated with the pure neolithic cultures of Sesklo, Dimini and Chaeroneia, belong to Tsountas types B and Δ and so, if wood-working tools, should have been used as adzes. That they were in fact thus mounted is proved by the position of the socket in the perforated antler sleeve from Dimini.[27]

Stone celts suitable for use as axe-heads (Tsountas' types A and Γ) predominate only in the „Bronze Age" in Thessaly. North of the Balkans, however, many of the earliest metal celts — copper „flat axes" and even some Unětician bronze tools — are evidently designed for use as adzes.

Accordingly this provisional survey of woodworking tools suggests a dichotomy of neolithic Europe into an „axe province" extending from the Alps to the Iberian Peninsula, and an „adze province" from the Alps to the Balkan Peninsula. If it be permissable, following the bold lead of San Valero Aparisi,[28] to extend our survey to the Fertile Crescent where many believe the neolithic economy originated, we find indications of a similar dichotomy. On the African horn of the Crescent in the neolithic Fayum[29] and at Merimde,[30] Mostagedda[31] and Armant[32] in Egypt, where Menghin, Vouga and others have recognized analogies to the earliest pottery and other traits of the West European neolithic, deliberately shaped adzes, though they do occur, form a minority among the stone celts; the majority are ill-fitted for any other use than axe heads.

In Mesopotamia stone celts are absolutely rare. Of the known celts some are specifically adze blades. Though such are not numerically preponderant among the specimens accessible to me, most Mesopotamian celts, even if symmetrical, lend themselves better to mounting as adzes than do the corresponding Egyptian „axes". We know that some at least were mounted on knee-shafts; at Arpachiya from the discolouration of the soil Mallowan[33] detected the outline of such a shaft, but, the wood having completely decayed, he could not observe the actual position of the blade in the handle and gratuitously reconstructed the implement as an axe. Be that as it may, neolithic Cyprus, as represented by 15 celts from Khirokitia and 7 from the later site of Erimi falls into line with Mainland Greece in a marked preference for adzes: 12 and 6 respectively.[34] But the pottery from Erimi is allied on the one hand to the painted „chalcolithic" wares of Mesopotamia, on the other to the Sesklo ware of Greece. To this extent there are some grounds for regarding a preference for adzes as an Asiatic, as against an African, trait.

A consideration of propulsive engines points in the same direction as the discussion of wood-working tools. The significance of the bow in the chase and war is of course familiar; for stone arrow-heads are among the most conspicuous prehistoric relics. In particular they abundantly attest the popularity of the bow in the Western neolithic province from the causewayed camps of England to El Garcel in Spain.

East of the Alps on the contrary arrow-heads, at least of stone, are conspicuously missing from the earliest (Spiralmaeander) Danubian settlements. Only in later Danubian cultures — Rössen, Stichband, Hinkelstein, where extended burial and other peculiarities may indicate infusions of alien, perhaps mesolithic, traditions — do flint arrow-heads and even arrow-shaft-straighteners directly proved the use of the bow. Similarly in the Middle Danube basin flint-arrow heads seem unknown to the Körös culture (and even its successor the Tisza — II — culture), but are first definitely attested in the subsequent Baden and Bodrogkeresztur cultures.[35]

In Yugoslavia arrow-heads are not a normal trait in the Starčevo culture[36] of

Milojčic, which overlaps with the Körös culture, and are conspicuously rare in his Vinča culture (my Morava culture[37]). First in the culture of Bubanj II,[38] which is related on the one hand to Baden, on the other to Early Helladic and Early Macedonian „Bronze Age" cultures, do they indicate a regular use of the bow. So on the Lower Danube stone arrow-heads are missing from the Boian A horizons of Wallachia and Bulgaria, to appear, again only sporadically in the Salcuța culture, the later phases of Gumelnița and Gaul's „Bulgarian Mound" culture.

South of the Balkans in Macedonia and Peninsular Greece the evidence is not merely negative. Not only are arrow-heads absent from these areas till the local Bronze Age, but the use of another weapon — the sling — is positively attested for neolithic Macedonia, Thessaly and Central Greece by unmistakable sling-pellets of baked clay or similarly shaped stone bullets.[39] The same propulsive weapon is attested by like evidence from the earliest neolithic of western Bulgaria and even for some phase of the Mound culture and also for neolithic Apulia.[40] Here sling-bullets are found associated with painted pottery of admittedly Balkan affinities on sites from which stone arrow-heads seem absent. South of the Balkans we may then fairly say that the sling took the place of the bow as the principal propulsive engine for hunters and warriors.

In default of positive evidence it would be premature to extend that generalization to the whole province east of the Alps. And nowhere need it be contended that the bow was unknown; the absence or rarity of flint arrow-heads merely justifies the conclusion that it was relatively unimportant whether in the chase or in war. But the recognition of the role of the sling in Greece, which is just an east Mediterranean extension of our Central European or Danubian province, gives positive content to the contrast with the Iberian peninsula, the corresponding extension of the Western province, where early evidence for the sling is as rare as that for the bow is abundant. Moreover the same dichotomy is observable in and around the Fertile Crescent where the cradle of Neolithic Culture itself might lie.

The western horn of the Crescent lies in a well recognized bow-and-arrow province whereas round the eastern horn slings takes the place of the bow in the earliest known cultures. The sling was never an Egyptian weapon, but flint arrow-heads are extremely common on all the earliest sites like Fayum, Merimde, and Badari. Conversely arrow-heads are missing from the earliest known sites in Mesopotamia — Hassuna, Jarmo and Matarrah — and Iran — Sialk and Bakun A — while clay sling bullets (Pl. XXI, fig. 2) are attested at Hassuna, Matarrah and Sialk as on all later sites with Halafian and al'Ubaid pottery; the bow is on the contrary unattested till the Uruk horizon east of the Euphrates.[39]

Now in Cyprus while a few arrow-heads have been identified in the earlier neolithic phase at Khirokitia, they are absent from the later neolithic site of Erimi where Dikaios found a hoard of pebbles that may well represent slingers' ammunition.[34] At the same time pottery links Erimi on the one hand with the Mesopotamian sling cultures of Hassuna and Tal Halaf, on the other with those of neolithic Greece. So in respect o propulsive instruments the Balkan peninsula in neolithic times went with the eastern

horn of the Fertile Crescent just as the Pyrenean peninsula went with the western horn. But in the same respect the Balkan peninsula, at least negatively, is attached to the Danubian neolithic province, the Pyrenean positively to the Western province.

Admittedly the distributions of the two traits or complexes here considered do not coincide exactly. So an explanation of the facts adduced in the terms of only two cultural currents from the Fertile Crescent would doubtless be a grave oversimplification. Nevertheless at the beginning of the New Stone Age in Europe the Western province does seem linked with the African horn of the Crescent by proficiency in archery and a free use of axes for chopping; Central Europe on the contrary is linked with the Asiatic horn, if not by a general use of slings, at least by a relative neglect of bows as well as by a preference for adzes in wood-working. These conclusions may, I hope, prove helpful in estimating the relative importance of western and eastern components in the lacustrine neolithic. But I must leave it to others to count the axes and adzes from the well excavated lake-dwellings and moor-villages.

Footnotes

[1] Paret O., Das neue Bild der Vorgeschichte, Stuttgart, 1946.

[2] Linton, „Ethnology of Polynesia and Micronesia", Field Museum Guide, No. 6, Chicago, 1926.

[3] Smith in Jessup North Pacific Expedition, vol. I (= American Museum of Natural History, Memoirs (Anthropology)), 1898—1900, p. 142.

[4] American Anthropologists, IX, 1906, p. 301.

[5] ibid., p. 297.

[6] E. g., American Bureau of Ethnology, 38th. Annual Report, 1916—17, Washington, 1924, p. 72; idem, Bulletin 143 (1946), pp. 298, 440.

[7] E. g., Sarasin, Ethnologie der Neu-Caledonier und Loyalty-Insulaner, München 1929, p. 116.

[8] Wollaston, Pigmies and Papuans, London, 1914, p. 148 and plate.

[9] W. E. Roth, North Queensland Etnography Bulletin No. 7, Dept. of Public Lands, Brisbane, 1904, pp. 18 ff.

[10] Cf. e. g., Graebner in Anthropos, 1909, pp. 746 and 764.

[11] Cuadernos de Historia Primitiva, III, 1948, pl. IX—X.

[12] Nantes Museum.

[13] Sussex Archaeological Collections, XXXIX, 1894, p. 197.

[14] Evans, John, Ancient Stone Implements of Great Britain, 1897, pp. 151 f.

[15] Archaeological Journal IV, 1847, p. 3.

[16] Childe, Skara Brae, London, 1931, pl. 36; the perforated antler sleeves of the S. O. M. culture on the other hand are all designed for axes, but these were presumably weapons rather than tools.

[16a] The impression given by museum collections may be misleading. At the only large neolithic settlement yet excavated and published, Maiden Castle, Dorset (Wheeler, Research Comittee of Society of Antiquaries of London, Report XII, 1943, pp. 166—171) out of 32 celts, all 7 of imported rock could have been axes and 5 out of 7 in polished flint, but only 5 out of 18 unpolished flint ones. But in factory sites like Graig Llwydd „axes" again seem to predominate (J. R. A. I., XVIII, 1919, pp. 353 ff.

[17] Manuel, i, p. 515 „Les herminettes, beaucoup plus rares que les haches".

[18] In the Museum of the Servicio Geologico, Academia das Sciencias, Lisbon. Compare note 21.

[19] Unpublished; I wish to thank Dr. and Mrs. Leisner for permission to refer to this important excavation.

[20] Die Megalithgräber der Pyrenäen-Halbinsel, I, 193, pp. 398, 400; Taf. I, II,4; VI, 3.

[21] „Steinerne Ackerbaugeräte", Internat. Archiv für Ethnographie, XIV, Leiden 1947, 78—156. His arguments apply to the Portuguese celts already accepted as adzes. The few complete limestone models of such celts mounted suffice to show that the handles were too short for hoes, but are just about the length of adze handles such as are for instance depicted in Old Kingdom tombs in Egypt which incidentally depict wooden hoes with much longer handles.

[22] Narodni Museum, Praha; Nezamyslice, Museum Přerov; Csoka, Varosi Muzeum, Szeged; Kotacpart, Dolgozatok, Szeged, IX/X, 1933/4, T. XVIII, 10.

[23] Banner, Das Tisza-Maros-Körös-Gebiet, Szeged, 1942, pp. 18, 38.

[24] Dolgozatok, Szeged, XII, 1936, p. 40.

[25] Milojčic, in B.S.A., XLIV (1949) 280, 292; cf. Dacia, II, 52 (Gumlenița); Menghin, Weltgeschichte der Steinzeit, 377.

[26] Izvestiya Bulgar. Arkheol. Institut, IV, 1926—1927, p. 256 (Balbunar); Izdanija na Narodniya Muzei, v Sofia, 1926, p. 25 (Sultan).

[27] Tsountas, Αἱ προϊστορικαὶ ἀκροπόλεις Διμηνίου καὶ Σέσκλου, fig. 243; cf. Mylonas, Ἡ νεολιθικὴ ἐποχὴ ἐν Ἑλλάδι, pp. 22, 42, 121.

[28] JB.S.G.U., 1947, 96—103.

[29] Caton Thomson, The Desert Fayum, pp. 25—7.

[30] Akad. d. Wissenschaften in Wien, phil.-hist. Kl., Denkschriften, LXVIII, 1928, pls. II—IV; id., Anzeiger, 1929, pls. XVI—XVIII.

[31] Brunton, Mostagedda, pl. XIII.

[32] Mond and Myres, The Cemeteries of Armant, I, 1937, pp. 207—210 — axes „very common", adzes „a small class".

[33] Iraq, II, fig. 52, 12.

[34] Dr. P. Dikaios has kindly sent me information to supplement that given in his „Excavations at Erimi", Report of the Department of Antiquities for 1936, Nikosia 1938.

[35] Banner, Das Tisza-Maros-Körös Gebiet, p. 87; B.R.G.K., 24/5, p. 52; Vildomec in Obzor, VIII, 1929 (with later Moravian painted pottery).

[36] Milojčic, B.S.A., XLIV, p. 266 says there are none, but Fewkes, Bul. Amer. School Prehist. Research, IX, 1933, p. 47 mentions „rare arrow-heads" from Starčevo.

[37] Milojčic, l. c., p. 273.

[38] Mitt. d. Prähist. Komm. d. Akad. Wien, IV, B., 1940.

[39] I have summarized the evidence in the Festschrift for Prof. Robinson, now in the press, where references to sling bullets from early sites in Mesopotamia and Iran have also been collected.

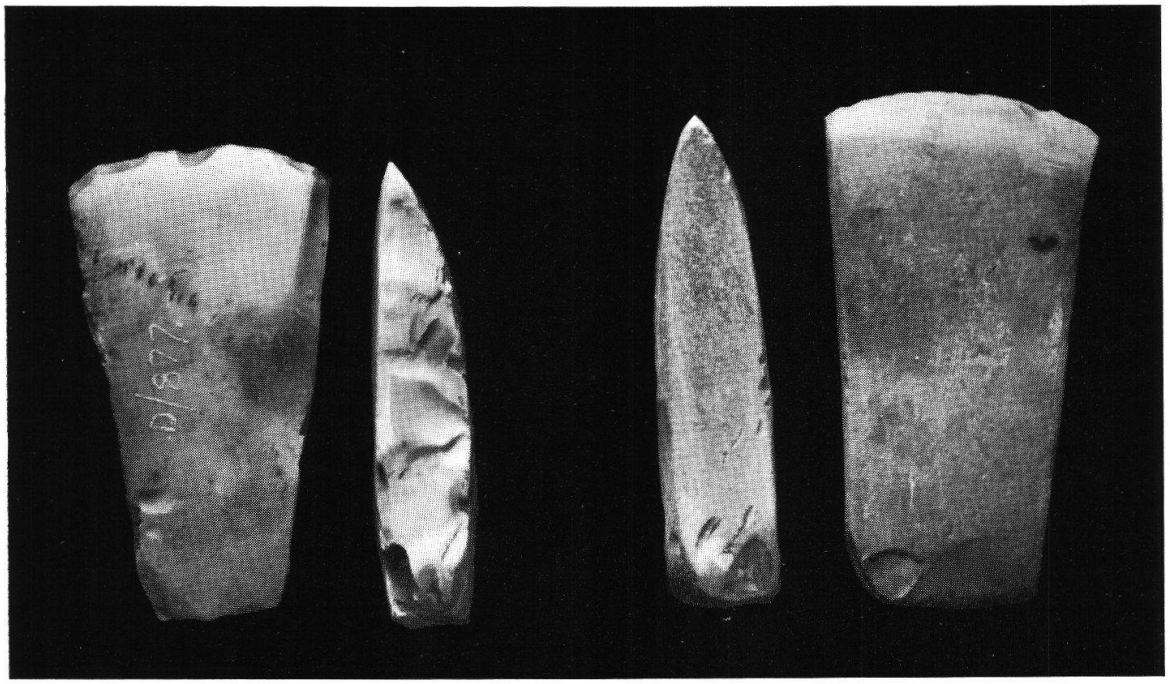
[40] B.P.I., XLVI, 152.

Résumé

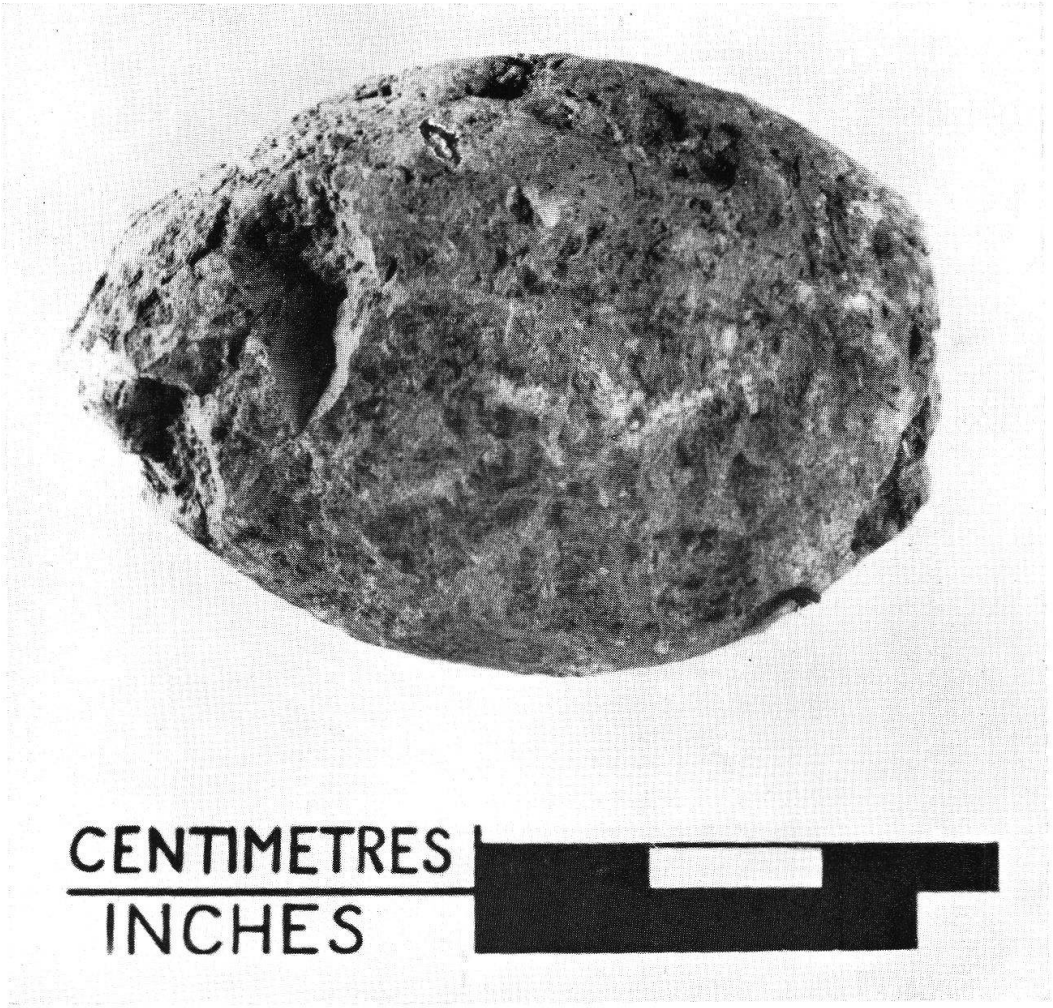
L'auteur propose, pour débrouiller la part des influences occidentales et orientales dans la civilisation néolithique de la région alpine, d'utiliser comme critères d'une part les outils à travailler le bois (hache, erminette), d'autre part la préférence des Néolithiques pour l'un ou l'autre des instruments de propulsion (arc et fronde).

L'abus du terme de „hache" a masqué l'importance de l'erminette dans les stations néolithiques. Celle-ci, asymétrique, se distingue facilement de la vraie hache. Passant en revue les centres néolithiques d'Europe et du „croissant fertile" nord-african et proche-asiatique, l'auteur déduit que les provinces occidentales de l'Europe néolithique, ou la vraie hache prédomine, semblent avoir des relations surtout avec l'extrémité africaine de ce „croissant fertile" (Egypte), tandis que les régions orientales (à erminettes surtout) se rattachent au Proche-Orient.

Il en est à peu près de même en ce qui concerne l'arc et la fronde: les pointes de flèches abondent à l'Occident, de l'Angleterre à l'Espagne méridionale, tandis que les premiers établissements danubiens à céramique rubannée n'en fournissent guère. Au sud des Balkans ce témoignage négatif est renforcé par la présence de balles de frondes (en argile cuite ou en pierre). Dans les régions asiatiques du „croissant fertile" la fronde prédomine — ou l'arc est absent — pour laisser la place à l'arc en Egypte, dans les premières civilisations.



Pl. XXI, fig. 1. Thick-butted flint axe and adze-blades, Sweden (p. 156—162)



Pl. XXI, fig. 2. Clay sling bullet from Hassuna, Iraq (p. 156—162)