



SCIENTIFIC SUMMARY

The goals of the conference were threefold: 1. To establish a lithic analytic baseline for the ARCANE project, especially through basic exchange of information between regions, 2. To establish the specific parameters of the ARCANE program and database with respect to lithic industries, and 3. To facilitate research in general by exchanging information, defining lacunae, and suggesting new research directions and questions. To these ends, presentations were made according to two general subjects, regional syntheses of lithic industries and assemblages, and adapting the ARCANE database to accord with the needs of lithic analysis, as per the goals of the ARCANE project.

In terms of regional syntheses, three general regions were examined, the Levant (especially the southern Levant), western Anatolia, and northern Mesopotamia (including eastern Turkey). Data from central and southern Mesopotamia are crucially missing; unfortunately this is a not an issue which can be adequately addressed. It is now established that the three regions for which we have reasonable data are in fact separate 'lithic' spheres, with distinct components and structures, contrasting one with the other. Thus, the basic components of the southern Levantine lithic industries consist of Canaanean blades, tabular scrapers, and a numerically dominant, and non-diagnostic, ad hoc tool component, primarily on flakes. Each of these reflects a different basic social configuration (that is, differing functions, technologies, degrees of specialization, distribution systems, and values). The western Anatolian system shows a non-Canaanean long blade tradition, arrowheads of Aegean types, and, like the Levant, a dominant ad hoc component. The northern Mesopotamian system shows Canaanean blades and less formal variants, small percentages of diagnostic arrowheads, a bladelet tool component, and like the other two, a dominant ad hoc component. In addition, the desert regions seem to show their own sets of diagnostic tools including transverse arrowheads and ad hoc blade and bladelet tools. On the edge of the Near Eastern system, Egyptian lithic industries constitute another separate system.

Directly related to these regional syntheses, the chronology, variability, and function, of Canaanean blades were discussed, although no hard and fast conclusions could be drawn. In particular, there are no discernible patterns of chronological distribution, the Levantine materials apparently appearing as early as those of Mesopotamia. The absence of these blades in western Anatolia suggests that the Balkans cannot be the ultimate source of the technology, in spite of the presence of early long blades. Variability in manufacture was discussed and the presence of different techniques and technologies of manufacture of long blades, all subsumed under the rubric 'Canaanean' was noted. Clearly more research is required to ascertain whether there are patterns in the different types of technologies used for the production of Canaanean blades.

The potentials of arrowhead typologies for chronology were also noted. The absence of Levantine arrowheads was discussed, especially in light of the contrast with the other regions.

In terms of the database, a set of lithic parameters, metric and typological, was constructed to be incorporated into the ARCANE database forms.

DESCRIPTION OF SCIENTIFIC CONTENT

Chipped stone assemblages have been recognized as an integral component of material culture in the ancient Near East for more than 100 years. However, the analytic potentials of these assemblages could only begin to bear fruit once the methods of prehistoric archaeology (especially in the study of waste assemblages, but also in the adoption of attribute approaches to artifact analysis and quantitative/statistical methods) developed over the course of the 20th century and were adopted into the study of later period stone tools. With increased sophistication of analysis and recognition of the role of chipped stone in Bronze Age societies in the ancient Near East, the past two decades have seen a major accumulation of basic data in the form of technical reports and studies, assemblage analyses, and sub-regional syntheses of lithic industries (The primary drawback to all of these works has been the lack of large scale synthesis, clearly a function of the political complexities of the region).

In terms of the *specific* chronological goals of ARCANE, the lithic industries play only a subsidiary goal. Lithic types are fewer and less chronologically sensitive than ceramic types. In spite of this, the lithic assemblages present special problems and issues which, in fact, are of primary importance to the underlying goals of ARCANE, the deeper understanding of the cultural and social trajectories of the ancient Near East. To this end, the following basic questions were addressed in the meeting:

1. The establishment of basic comparative typology, including technological definitions, so that researchers can communicate across regions. Such 'types' and rubrics as Canaanian blades, tabular (fan-) scrapers, different shapes of arrowheads, and the range of ad hoc tools have been used in different ways across the Near East and it is important that some pan-Near Eastern comprehension of the basic vocabulary be established. These types would be tied to technologies and technological structures.
2. A chronology of these types and technologies, both absolute and relative, according to geographic region, can be established. Notably, there are clear differences between regions. Chipped stone arrowheads disappear from the southern Levantine inventory much earlier than from the Mesopotamian. Transverse arrowheads appear primarily in the desert zones.
3. Functional contrasts, tied to different chronologies, can also be established and tied to differences in access to raw materials (for example, access to metals as a replacement material, access to flint sources, access to obsidian), differences in activities, and differences in levels of specialization.

4. Finally, larger scale schema of social change and dynamics can be constructed, tying the lithic variability to other phenomena. For example, the rise and decline of Canaanite blade technology can hopefully be traced both over time and over space, incorporating social explanations for both its rapid diffusion in the 4th millennium BC and apparent displacement at the end of the 3rd millennium BC. Similarly, the social aspects of other types (arrowheads, tabular scrapers, and others) can also be tackled.

Presentations were presented geographically, according to the divisions as per the ARCANE program

S.A. Rosen, The Southern Levantine Materials (the Mediterranean Zone and the Desert Zone): Three lithic systems can be defined, the Mediterranean System (ad hoc tools, tabular scrapers, and Canaanite blades), the desert (Timnian System) (ad hoc tools, tabular scrapers, transverse arrowheads, microlithic drills), and the Egyptian System, a short term intrusion into the southern Levant at the end of the 4th millennium BC including bitruncated short prismatic blades, bladelet tools, formal scrapers, and bifacial invasively retouched knives. Each system operates with its own sets of diagnostic elements, its own *chaînes opératoire*, and in general according to separate cultural trajectories.

I. Gatsov, Lithic Industries of the Marmara and Thrace: Lithic materials from selected sites including Troy and Kolluoba were reviewed. The Troy materials show a flake dominated industry with few blades, some bi-cortical knives with bifacial retouch, and the use of microliths. The Kolluoba materials show long blades approximating the Canaanite industry in general aspect, but contrasting significantly in an emphasis on cortical lateral edges (natural backing). Arrowheads, of a general Aegean aspect, are also present. The Marmara and Western Anatolian materials contrast markedly with those from areas farther east.

M. Zambello, The Chipped Stone Industries from the Tigridian and Eastern Anatolia Regions in the 3rd Millennium BC: Lithic materials from the region were reviewed, including those from Beydar, Kashkoshok III, Arbid, Brak, Zeytinli Bahce, Chagar Bazar, Tell Mabtouh, and Arslantepe. The following features were noted: the dominance of ad hoc tools, the general presence, in small numbers of small arrowheads of a number of types, varying quantities of obsidian, a dedicated bladelet industry, and the characteristic presence of Canaanite blades. Variability in Canaanite blade production was suggested, with direct percussion, indirect percussion, and levered pressure removal of blades at different stages of the *chaîne opératoire*. Contrasts were also noted between local and exogenous raw materials used for the production of the blades, perhaps corresponding to different techniques.

B. Hartenberger, The Canaanite Blade Workshop at Titris Hoyuk and Its Associated Lithic Assemblage: The materials from the unique Canaanite blade workshop at Titris Hoyuk were presented, in the context of the site and the region. The domestic contexts of the workshop were emphasized, and a spatial analysis suggested distinctions within the workshop area. The special technology evident at Titris was presented, and the workshop materials were contrasted with the materials from the remainder of the site. It is estimated that some 2000 cores were present in the workshop, most seeming to have been stored as opposed to discarded, and the majority not exhausted and with no obvious reason for discard.

Eric Coqueugnot, Lithic Assemblages from Excavations at Mari: Three separate lithic assemblages from Mari were presented. Two assemblages from palace contexts reflect specialized workshops for the production and maintenance of inlays, and showed a dominance of microborers and microtruncations, apparently used for fine incising. The

contrast with the usual use of microborers for bead manufacture is of interest. The apparently vertical specialization, where the production loci showed the full set of activities with the materials associated with inlay production, including the manufacture of the stone tools, was noted. The third assemblage, from a deep sounding, showed what appears to be a more utilitarian assemblage, including sickles, ad hoc tools, and even a few tabular scrapers.

Jacques Chabot, *Lithics from Northern Mesopotamia: A synthetic review of materials from a set of sites ('Atij, Gudeda, Raqa'I, Nusstell, Mozan, Kashkashok, Kutun)* was presented in absentia based on a slide presentation. Ad hoc tools dominate. Technological studies of Canaanean blade production suggest the use of levered pressure removal for the final products, and use of direct and indirect percussion for preparation of cores and removal of less formal blades. Microwear analyses indicate exclusive use of Canaanean blades for threshing teeth in this region.

In addition to the regional presentations, discussions reviewing definitions, concepts, and comparing regions, industries, and assemblages were conducted. Contrasts between regions were evident. The Western Anatolian region clearly contrasts with the Levant and Mesopotamia, most notably in the apparent absence of Canaanean blade technology, and the use of arrowheads stylistically akin to those of the Aegean. This is important since it suggests that the source of Canaanean long blade technology ought not to be sought in the Balkans or in Greece, in spite of the early presence of long blade technologies there. The Levantine materials contrast with those of Mesopotamia most notably in the absence of arrowheads (excepting the transversal types of the desert regions). The arrowheads of Mesopotamia, although relatively rare and usually constituting less than 1% of any lithic assemblage, show potential as stylistic chronological markers.

Discussion focused on several aspects of Canaanean blades. The issue of definition was reviewed. The first approach, based on technological analysis, suggested definition of the technology be restricted to those blades removed from cores using a lever pressure technique, and perhaps blade by-products of this technological mode. The second approach, based on the historical phenomenon of pan-Near Eastern adoption of long blades in the early-middle 4th millennium BC, suggests that all of the long prismatic blades be defined as Canaanean, with technological variants in different areas or sites, or perhaps with chronological significance. Clearly more research is required to ascertain whether there are social, chronological, or geographic patterns in the different types of technologies used for the production of Canaanean blades.

Notably, no clear chronological priorities could be assigned to the appearance of Canaanean blades, the Levantine materials apparently appearing as early as those from farther east. In terms of the end of Canaanean blade production, Mesopotamian materials showed apparent precursors to the Large Geometric sickles known from the second millennium BC in the presence of acutely truncated Canaanean blades (resembling the acute truncations found later in Large Geometrics). In the Levant the transition to the flake-blade technologies of Large Geometric sickles seems to occur with the very beginning of the Middle Bronze Age. It is likely that this is the case for the Anatolian and Mesopotamian materials as well, but reliable data are not yet available to confirm this hypothesis.

Function of Canaanean blades, especially the sickle versus threshing teeth debate, was reviewed. Participants by and large rejected the idea the exclusive use of Canaanean blades as threshing teeth, and the absence of Canaanean sickles, even in areas where the microwear analyses suggest this.

In addition to the substance of lithic assemblages and industries, the modification of the database to accord with the demands of the lithic industries was discussed. The basic concepts of the database, developed from FileMaker, were introduced: units, complexes, sites, inventories, composite inventories, artificial inventories, synopsis files, additional files, and individual entry fields. All were noted on the actual data entry forms. The flexibility of the system was emphasized and the general needs of the lithic analysts (or rather the lithic assemblages and industries), including such issues as multiple entries, functional typologies, other typologies, attribute lists, type lists, metrics, and raw materials were discussed. It is important to remember that ARCANE is not intended to replace proper detailed site reports, descriptions and analyses. It has specific goals focusing on regional and supra-regional chronological analysis. Entry of analytic details not relevant to these goals (at some basic level) will overload the system unnecessarily.

and a tentative set of parameters was constructed and submitted to Jean-Paul Thalmann for integration into the ARCANE data base. This list was based on the type list published in Rosen's *Lithics After the Stone Age*, modified to fit the needs of other regions.

ASSESSMENT

The ARCANE Lithics conference resulted in three general conclusions or sets of results, those attached to the specific goals of ARCANE, substantive new understandings achieved in the realm of lithic industries, and new ideas and directions for future research:

1. The goal of the ARCANE project is the construction of a detailed database on which a reliable cross-regional chronology for the third millennium BC in the Near East can be constructed. To this end, a lithic type and attribute list, to be appended to the additional tables of the Object files, was constructed. The list was designed for the purposes of the ARCANE project, and is not a general lithic analytic program. The ultimate success of this list can only be measured after the lithic materials have been entered from each of the target assemblages and integrated into a larger chronological framework.

2. In terms of the substance of the lithic industries and assemblages from the third millennium BC in the Near East, the comparison of materials from different regions, and the review of definitions and analytic conceptions, revealed significant variability not recognized earlier. Variability was on one level regional, such that the basic regions represented (the southern Levant, northern Mesopotamia, and western Anatolia, along with two sub-regions, Egypt [in terms of its presence in southwestern Palestine in the third millennium BC] and the southern deserts) show contrasting functional and technological configurations. While perhaps implicitly understood prior to this meeting, the explicit documentation of these regional contrasts constitutes a new idea, a new datum from which analyses can proceed. On a second level, greater complexity in technological systems was acknowledged than heretofore recognized, especially in the production of Canaanite blades. While some of this complexity may be associated with geographic variability, other aspects of variability may have to do with raw material properties, access to raw materials, skill levels, and degrees of specialization in production. Given the absence of super-regional synthesis prior to this meeting, the definition of these issues itself constitutes a significant statement.

3. In terms of new directions and issues, the meeting indicated both lacunae in our knowledge which need to be addressed, and new subjects and methods to be explored. Geographic lacunae are most evident in central and southern Mesopotamia, where only old collections, biased by obsolete collection methods, are available for study. Obviously these lacunae cannot be addressed due to political exigencies. In this context, the problem of collection methods still constitutes a significant issue in most excavations. Selected collections with little or no waste still dominate, resulting in biased and unreliable samples from which few conclusions can be drawn. This is especially the case for small objects such as arrowheads and microliths, of especial importance for chronologies.

As indicated in the preceding section, the issue of technological variability needs to be addressed systematically. Criteria for classifying blade technologies beyond morphological type need to be made explicit and applied over the entire expanse of the Near East. Similarly, systematic study of such formal elements as arrowheads needs to be undertaken over as wide a geographic and chronological range as possible, for both establishing chronological patterns, as well as social patterns.

It is clear that further meetings, with expanded participation, will bear fruit. It was tentatively decided that a session of the International Congress of the Archaeology of the Ancient Near East (ICAANE), to be held in London in 2010, would be an ideal venue.

MEETING PROGRAM

Day 1: 13 April

Arrival at Blaubeuren

Day 2: 14 April

9:00-9:15 Introductory Remarks (S. Rosen)

Presentation of the ARCANE program to the workshop (de Miroschedji)

9:15-9:45 Introduction to the ARCANE Project (P. de Miroschedji)

Introduction of participants, their research activities (S. Rosen)

9:45-10:30 Introduction of ARCANE database (J.-P. Thalmann)

10:30-11:00 coffee break

11:00-12:30 Detailed review of ARCANE, with discussion and examples

12:30-14:00 Lunch

14:00-16:00 The Southern Levantine Materials (the Mediterranean Zone and the Desert Zone) (S. Rosen)

16:00-16:30 Coffee

16:30-17:30 Lithic Industries of the Marmara and Thrace (I. Gatsov)

17:30-18:30 The Chipped Stone Industries from the Tigridian and Eastern Anatolia Regions in the 3rd Millennium BC (M. Zambello)

18:30- Dinner

Day 3: 15 April

9:00-10:00 The Canaanite Blade Workshop at Titris Hoyuk and Its Associated Lithic Assemblage (B. Hartenberger)

10:00-10:30 Lithic Assemblages Excavations at Mari (E. Coqueugniot)

10:30-11:00 Coffee break

11:00-12:30 Mari Continued

Lithics from Northern Mesopotamia (J. Chabot, presented in absentia)

12:30-14:00 Lunch

14:00-16:00 Regional Sequence reviews and discussion

16:00-16:30 Coffee break

16:30-19:00 Database review and modification to accord with lithic materials.