

UNIVERSITÀ DEGLI STUDI DI ROMA "LA SAPIENZA"
CENTRO INTERUNIVERSITARIO DI RICERCA SULLE CIVILTÀ E
L'AMBIENTE DEL SAHARA ANTICO E DELLE ZONE ARIDE
DEPARTMENT OF THE ANTIQUITIES OF LIBYA

THE UAN AFUDA CAVE

HUNTER-GATHERER SOCIETIES OF CENTRAL SAHARA

Edited by
SAVINO DI LERNIA

ARID ZONE ARCHAEOLOGY
MONOGRAPHS 1



Edizioni All'Insegna del Giglio

1999

ARID ZONE ARCHAEOLOGY, MONOGRAPHS

Mario Liverani, Series Editor

This series collects original case studies dealing with ancient societies from the Late Pleistocene throughout historical period. Focus is on cultural transformations, economic organisation, and palaeoenvironmental reconstruction. Area of interest is the arid belt stretching from North Africa (Sahara and Nile Valley, in particular) to the Arabic peninsula up to central Asia.

EDITORIAL BOARD

Mario Liverani, Mauro Cremaschi and Giorgio Manzi

ADVISORY BOARD

Carla A. Accorsi, University of Modena
Isabella Caneva, University of Rome "La Sapienza"
Andrew B. Smith, University of Cape Town
Katharina Neumann, University of Frankfurt
George Stoops, University of Gent

LANGUAGE CONSULTANT

Gianna G. Ayala, Rome

DRAWING

Giovanni B. Bertolani, Rome
Leonarda De Ninno, Rome

Volume pubblicato con contributo dell'Università di Roma "La Sapienza"

ISBN 88-7814-166-6

© 1999 – All'Insegna del Giglio s.a.s. - Via R. Giuliani, 152r, Firenze

Finito di stampare nel novembre 1999

Stampa: Stabilimento Grafico Commerciale – Firenze

THE UAN AFUDA CAVE
HUNTER-GATHERER SOCIETIES OF
CENTRAL SAHARA

Edited by
SAVINO DI LERNIA

with contributions of

E.S. AZZEBI, L. CASTELLETTI, E. CASTIGLIONI, M. COTTINI,
M. CREMASCHI, A.A. MAGID, G. MANZI, A. MASPERO,
A.M. MERCURI, P. PASSARELLO, M. ROTTOLI, L. TROMBINO

with foreword by M. LIVERANI and a comment by A.B. SMITH

ARID ZONE ARCHAEOLOGY

MONOGRAPHS 1

Contents

Contributors	.....	IX
Illustrations	.....	XI
Tables	.....	XV
Foreword	<i>Mario Liverani</i>	XII
Commentary	<i>Andrew B. Smith</i>	XIX
A preface by the Editor	<i>Savino di Lernia</i>	XXI
Acknowledgements	<i>Savino di Lernia</i>	XXIII
Chapter One	Why Uan Afuda? The “pre-pastoral” archaeology of the Acacus and surroundings <i>Savino di Lernia</i>	1
Chapter Two	The 1993 and 1994 excavations. Geomorphology, stratigraphic context and dates <i>Mauro Cremaschi and Savino di Lernia</i>	9
Chapter Three	A micromorphological approach to the site formation processes <i>Mauro Cremaschi and Luca Trombino</i>	27
Chapter Four	Rock art paintings of the “Round Heads” phase <i>Savino di Lernia</i>	39
Chapter Five	A particular form of human activity: rock markings, cupules and kettles <i>Savino di Lernia</i>	49
Chapter Six	The cultural sequence <i>Savino di Lernia</i>	57
Chapter Seven	Archaeobotanical analysis of charcoal, wood and seeds <i>Lanfredo Castelletti, Elisabetta Castiglioni, Michela Cottini and Mauro Rottoli</i>	131
Chapter Eight	Palynological analysis of the Early Holocene sequence <i>Anna Maria Mercuri</i>	149
Chapter Nine	Preliminary study of plant impressions in pottery <i>Anwar A. Magid</i>	183
Chapter Ten	Spinning and plaiting <i>Alfio Maspero</i>	189
Chapter Eleven	Human remains – deciduous and permanent teeth <i>Giorgio Manzi and Pietro Passarello</i>	203
Chapter Twelve	Delayed use of resources: significance of Early Holocene Barbary sheep dung <i>Savino di Lernia</i>	209
Chapter Thirteen	Assembling the evidence: cultural trajectories at Uan Afuda Cave <i>Savino di Lernia</i>	223
Bibliography	.....	239
Colour plates	.....	255
Arabic Summary	<i>Ebrahim Saleh Azzebi</i>	272

Contributors

- Ebrahim Saleh Azzebi*
Department of Antiquities, Tripoli, Libya.
- Lanfredo Castelletti*
Laboratorio di Archeobiologia dei Musei Civici di Como, Piazza Medaglie d'Oro 1, 22100 Como, Italy.
- Elisabetta Castiglioni*
Laboratorio di Archeobiologia dei Musei Civici di Como, Piazza Medaglie d'Oro 1, 22100 Como, Italy.
- Michela Cottini*
Laboratorio di Archeobiologia dei Musei Civici di Como, Piazza Medaglie d'Oro 1, 22100 Como, Italy.
- Mauro Cremaschi*
CNR, Centro Geodinamica Alpina e Quaternaria, Via Mangiagalli 34, 23100 Milano, Italy.
- Savino di Lernia*
Dipartimento di Scienze Storiche, Archeologiche e Antropologiche dell'Antichità, Università degli Studi di Roma "La Sapienza", Via Palestro 63, 00185 Rome, Italy.
- Anwar A. Magid*
Centre for Development Studies, University of Bergen, Stromgaten 54, N-5007 Bergen, Norway.
- Giorgio Manzi*
Dipartimento di Biologia Animale e dell'Uomo, Università degli Studi di Roma "La Sapienza", Ple Aldo Moro 5, 00185 Rome, Italy.
- Alfio Maspero*
Laboratorio di Archeobiologia dei Musei Civici di Como, Piazza Medaglie d'Oro 1, 22100 Como, Italy.
- Anna Maria Mercuri*
Laboratorio di Palinologia e Paleobotanica, Orto Botanico - Università di Modena, Viale Caduti in Guerra 127, 41100 Modena, Italy.
- Pietro Passarelli*
Dipartimento di Biologia Animale e dell'Uomo, Università degli Studi di Roma "La Sapienza", Ple Aldo Moro 5, 00185 Rome, Italy.
- Mauro Rottoli*
Laboratorio di Archeobiologia dei Musei Civici di Como, Piazza Medaglie d'Oro 1, 22100 Como, Italy.
- Luca Trombino*
CNR, Centro Geodinamica Alpina e Quaternaria, Via Mangiagalli 34, 23100 Milano, Italy.

Illustrations

- Figure 1.1, p. 2 – The Sahara and the main sites discussed in the text.
- Figure 1.2, p. 3 – The Tadrart Acacus massif, with location of the main Early Holocene sites.
- Figure 1.3, p. 7 – View of Uan Afuda Cave, in the Wadi Kessan, central Acacus.
- Figure 1.4, p. 8 – The Tadrart Acacus mountain range and surroundings, area of field-work of the Italo-Libyan Joint Mission of the University of Rome “*La Sapienza*”.
- Figure 2.1, p. 10 – View of the Uan Afuda Cave, from the interior.
- Figure 2.2, p. 10 – The first test pit at Uan Afuda in the atrial part of the cave during the 1993 Mission.
- Figure 2.3, p. 11 – The new excavation of 1994, including the 1993 test pit.
- Figure 2.4, p. 12 – Map and sections of the Uan Afuda Cave.
- Figure 2.5, p. 13 – View of the atrial area of the Uan Afuda Cave, seen from the interior.
- Figure 2.6, p. 13 – The intermediate part of the Uan Afuda Cave: on the left the large boulder with rock markings.
- Figure 2.7, p. 14 – The internal part of the Uan Afuda Cave.
- Figure 2.8, p. 15 – The planimetry of the excavations and square numbering.
- Figure 2.9, p. 16 – Stratigraphic section of the southern wall of the 1993 excavation.
- Figure 2.10, p. 18 – Stratigraphic section of the eastern wall of the 1994 excavation.
- Figure 2.11, p. 19 – View of the upper part of the stratigraphic sequence.
- Figure 2.12, p. 19 – The stone-line (Layer 2s) features a concentration of stones, lithics and fragments of grinding stones.
- Figure 2.13, p. 20 – Layer 4s, interpreted as the remains of a dwelling structure (contour of a hut?).
- Figure 2.14, p. 20 – The residual strip of Layer 8, with some Aterian lithic finds.
- Figure 2.15, p. 21 – The collapse of the vault: several large boulders, found in both the 1993 and 1994 excavations, occupy almost all of the excavation area.
- Figure 2.16, p. 22 – The Early Holocene sequence at Uan Afuda, in uncalibrated radiocarbon years bp.
- Figure 2.17, p. 23 – The Early Holocene sequence at Uan Afuda, in calibrated radiocarbon years BC.
- Figure 3.1, p. 28 – Cross section of the Uan Afuda Cave and location of the sampled areas.
- Figure 3.2, p. 28 – The Excavation I profile and location of micromorphological and bulk samples.
- Figure 3.3, p. 33 – Grain size cumulative curves.
- Figure 3.4, p. 34 – Chemical and grain size analyses.
- Figure 4.1, p. 41 – The wall of Uan Afuda Cave with the rock art paintings.
- Figure 4.2, p. 41 – General sketch of the painted wall of the Uan Afuda Cave.
- Figure 4.3, p. 42 – The paintings reproduced by Piero Guccione and Lorenzo Tornabuoni, published by Mori in 1965.
- Figure 4.4, p. 43 – The large boulder with “kettles”, “cupules” and other rock markings in the intermediate area of the cave.
- Figure 4.5, p. 44 – Scene 1: a male figure, probably levitating with the right hand open and a club in the left hand.
- Figure 4.6, p. 44 – Scene 2: a human figure, probably male; below, an animal difficult to identify.
- Figure 4.7, p. 45 – Scene 3: two human figures near a large antelope.
- Figure 4.8, p. 46 – Scene 4: subject 1 is a quadruped with very curved horns, in green. Subject 2 is a rather schematic animal.
- Figure 4.9, p. 47 – Scene 5: a serpent-like figure in red.
- Figure 5.1, p. 50 – General view of the sandstone outcrop in the Uan Afuda Cave.

ILLUSTRATIONS

- Figure 5.2, p. 51 – View of the short side of the “large carved boulder”.
- Figure 5.3, p. 52 – A detail of some cupules and steps, view from the inside of the cave.
- Figure 5.4, p. 53 – Drawing of the “large carved boulder”.
- Figure 5.5, p. 55 – A kettle on a collapsed boulder in the proximity of the In Taharig shelter.
- Figure 5.6, p. 55 – A particular concentration of cupules and kettles at site Ti-n-Tabrakak.
- Figure 5.7, p. 55 – Fabrizio Mori close to a large kettle at site Ti-n-Tabrakak.
- Figure 6.1, p. 60 – The 1994 excavation at Uan Afuda Cave.
- Figure 6.2, p. 61 – Aterian lithic material from the Late Pleistocene layers.
- Figure 6.3, p. 62 – The residual of Aterian occupation in the 1994 excavation.
- Figure 6.4, p. 64 – The 5m stone structure in the “Epipalaeolithic” or “Early Acacus” phase, ^{14}C dated to 9765 ± 105 years bp.
- Figure 6.5, p. 65 – Typical hearth of the “Epipalaeolithic” or “Early Acacus” phase.
- Figure 6.6, p. 66 – The hearth found at the contact between the Organic Unit 1 and the Colluvial Unit 2: Foc. 7h.
- Figure 6.7, p. 66 – “Smoothed” density of lithic artefacts in the “Epipalaeolithic” or “Early Acacus” Layer 5m.
- Figure 6.8, p. 67 – Outcrops of silicified sandstone set in the Silurian-Devonian sandstone of the Acacus.
- Figure 6.9, p. 68 – Important sources of grey quartzite, intensively exploited in the past, are located in the northern Acacus.
- Figure 6.10, p. 70 – Typometrical structure of the “Epipalaeolithic” or “Early Acacus” lithic industry.
- Figure 6.11, p. 73 – Microlithic component (mostly backed tools) of the “Epipalaeolithic” or “Early Acacus” industry.
- Figure 6.12, p. 74 – Macrolithic component of the “Epipalaeolithic” or “Early Acacus” industry.
- Figure 6.13, p. 75 – Typometrical structure of lithic artefacts of Layer 6-7.
- Figure 6.14, p. 77 – Typometrical structure of lithic artefacts of Layer 5-epi.
- Figure 6.15, p. 79 – Typometrical structure of the lithic artefacts of Layer 7.
- Figure 6.16, p. 81 – “Epipalaeolithic” or “Early Acacus” phase: Cluster Analysis using Ward method of some indices of the lithic industry.
- Figure 6.17, p. 83 – The structured hearth (F1) found in the 1993 excavation.
- Figure 6.18, p. 84 – The concretioned ashy plaque is the fire-related structure number 1, excavated in 1994.
- Figure 6.19, p. 84 – The structured hearth 5 (square C5, Layer 1), excavated in 1994.
- Figure 6.20, p. 85 – Concentration of fire structures in the north-western sector of the excavation 1994.
- Figure 6.21, p. 85 – Detail of structure 6.
- Figure 6.22, p. 86 – Structure 4s, excavated in the 1994 season.
- Figure 6.23, p. 87 – Contour lines of the frequency of some archaeological indicators of “Mesolithic” or “Late Acacus” occupations.
- Figure 6.24, p. 89 – Rims of ceramic containers of the “Mesolithic” or “Late Acacus” occupation.
- Figure 6.25, p. 91 – Rims of ceramic containers of the “Mesolithic” or “Late Acacus” occupation.
- Figure 6.26, p. 92 – Rims of ceramic containers of the “Mesolithic” or “Late Acacus” occupation.
- Figure 6.27, p. 93 – Decorated pottery from the “Mesolithic” or “Late Acacus” occupation.
- Figure 6.28, p. 94 – Decorated pottery from the “Mesolithic” or “Late Acacus” occupation.
- Figure 6.29, p. 95 – Decorated pottery from the “Mesolithic” or “Late Acacus” occupation.
- Figure 6.30, p. 96 – Decorated pottery from the “Mesolithic” or “Late Acacus” occupation.
- Figure 6.31, p. 97 – Potsherds showing traces of re-use (1-3) and evidence of content residue (4-5).

ILLUSTRATIONS

- Figure 6.32, p. 99 – Lithic material of the “Mesolithic” or “Late Acacus” layers.
- Figure 6.33, p. 100 – Lithic material of the “Mesolithic” or “Late Acacus” layers.
- Figure 6.34, p. 102 – Lithic material from the “Mesolithic” or “Late Acacus” layers.
- Figure 6.35, p. 103 – Lithic material of the “Mesolithic” or “Late Acacus” layers.
- Figure 6.36, p. 104 – Typological structure of lithic artefacts of Layer 1.
- Figure 6.37, p. 105 – Typological structure of lithic artefacts of Layer 2.
- Figure 6.38, p. 107 – Typometrical structure of lithic artefacts of Layer 3.
- Figure 6.39, p. 108 – Typometrical structure of lithic artefacts of Layer 4.
- Figure 6.40, p. 109 – Typometrical structure of lithic artefacts of Layer 5.
- Figure 6.41, p. 110 – Typometrical structure of lithic artefacts of the “Mesolithic” or “Late Acacus” lithic Industry.
- Figure 6.42, p. 112 – Lithic industry of the “Mesolithic” or “Late Acacus” layers.
- Figure 6.43, p. 114 – Macrolithic industry of the “Mesolithic” or “Late Acacus” layers.
- Figure 6.44, p. 119 – Cluster analysis using the Ward method of all the variables of the lithic industry.
- Figure 6.45, p. 120 – Cluster analysis using the Ward method of some main characteristics of the lithic industry of the “Late Acacus” phase.
- Figure 6.46, p. 123 – Shaped artefacts of schist, from the “Mesolithic” or “Late Acacus” Layers 1 and 2.
- Figure 6.47, p. 124 – Decorated ostrich eggs and bone tools.
- Figure 6.48, p. 125 – Wood and horn tools.
- Figure 6.49, p. 126 – Wooden spatula of *Calotropis*.
- Figure 6.50, p. 127 – Basketry remains.
- Figure 6.51, p. 128 – Frequencies of raw materials and the Typological Groups by cultural phases.
- Figure 6.52, p. 129 – Cumulative curve of lithic industry, by stratigraphic context.
- Figure 6.53, p. 130 – Cumulative curve of lithic industry, by cultural phases.
- Figure 7.1, p. 136 – Uan Afuda (Layer 1 B6): *Tamarix* sp., transverse section.
- Figure 7.2, p. 136 – Uan Afuda (hearth 8): *Acacia* sp., transverse section.
- Figure 7.3, p. 137 – Uan Afuda (Layer 5-epi E6): *Ephedra* sp., transverse section.
- Figure 7.4, p. 137 – Uan Afuda (hearth 8): *Ficus* sp., transverse section.
- Figure 7.5, p. 138 – Uan Afuda (Layer 6 B5): n.d.-1, radial section: vessel with structures that simulate scalariform perforation plates.
- Figure 7.6, p. 140 – Uan Afuda (Layer 1 D5): *Ficus salicifolia*, false fruit.
- Figure 7.7, p. 140 – Uan Afuda (Layer 1 C8): *Ficus* cf. *sycomorus* and *Ficus* sp. with sign of parasite.
- Figure 7.8, p. 141 – Uan Afuda (Layer 2 E6): *Cyperus rotundus*-type: tuber (?).
- Figure 7.9, p. 141 – Uan Afuda: human coprolite (?).
- Figure 7.10, p. 143 – Uan Afuda: number of woods by diameter.
- Figure 7.11, p. 143 – Uan Afuda: wood and charcoal reciprocal ratio.
- Figure 7.12, p. 144 – Distribution of taxa in the “Epipalaeolithic” (Early Acacus) and “Mesolithic” (Late Acacus).
- Figure 7.13, p. 144 – Uan Afuda: Distribution of taxa by layers and their percentages.
- Figure 8.1, p. 151 – Location map of the Uan Afuda Cave and stratigraphy of the sequence sampled for pollen analyses.
- Figure 8.2, p. 166 – Concentration pollen diagram, selected taxa.
- Figure 8.3, p. 166 – Percentage pollen diagram, selected taxa.
- Figure 8.4, p. 167 – Percentage pollen diagram, selected sums.
- Figure 8.5, p. 169 – Synthetic pollen spectra, mean percentages of UAF pollen zones.
- Figure 8.6, p. 174 – Pollen of Gramineae.
- Figure 8.7, p. 177 – Pollen of *Echium* in the dung layer from the inner part of the cave.
- Figure 9.1, p. 184 – Potsherds with plant impressions.
- Figure 9.2, p. 186 – A positive cast of an impression of a grain of *Setaria* sp.

ILLUSTRATIONS

- Figure 9.3, p. 186 – A positive cast of an impression of a grain of *Panicum* sp.
- Figure 10.1, p. 190 – End of a rope made by leaves (*lamina*) of grass.
- Figure 10.2, p. 190 – Two fragments of ropes.
- Figure 10.3, p. 191 – Rope with a knot.
- Figure 10.4, p. 191 – Raw material of the rope with a knot represented in Fig. 10.3.
- Figure 10.5, p. 192 – Strings made by bast fibres obtained from the bark of “textile plants”.
- Figure 10.6, p. 193 – Two ply strings, splicing point on the second coil.
- Figure 10.7, p. 193 – Two ply strings.
- Figure 10.8, p. 194 – Features of twisted fibres.
- Figure 10.9, p. 195 – Bundle of bast fibres.
- Figure 10.10, p. 195 – Single bast fibre.
- Figure 10.11, p. 197 – Pre-Roman Textile (8th century BC) from the bandages of the Hissurhet’s mummy.
- Figure 10.12, p. 198 – Hypothetical image of a string. The relationships between diameters, torsion, and titre of a yarn are evident.
- Figure 10.13, p. 200 – Fragment of mat, or basket, made by interlaced rush.
- Figure 10.14, p. 200 – The technique used at Ti-n-Hanakaten (after Aumassip 1988), is the same used at Uan Afuda.
- Figure 10.15, p. 201 – Raw material from a fragment of an interlaced object.
- Figure 11.1, p. 204 – From left to right, vestibular, mesial and lingual views of the human teeth.
- Figure 11.2, p. 205 – Close distal view of Uaf.H3 to show details of wear due to extra-alimentary agents (arrows).
- Figure 12.1, p. 210 – The discovery of dung in the inside of the Uan Afuda Cave.
- Figure 12.2, p. 210 – Lump of dung collected in the Layer 1, Excavation I.
- Figure 12.3, p. 212 – Bulk sample of dung collected in Excavation IV subject of micromorphological, botanical and palinological analyses.
- Figure 12.4, p. 216 – “Round Heads” painting of a Barbary sheep from the shelter of Anshal IV, central Acacus.
- Figure 12.5, p. 216 – Evidence of a trampling surface on the lump collected in the Layer 1.
- Figure 12.6, p. 217 – Two specimens, a male and a female, of *Ammotragus lervia*, in captivity.
- Figure 12.7, p. 218 – The internal part of the Uan Afuda Cave.
- Figure 13.1, p. 227 – View of the remains of an ancient lake in the Erg Uan Kasa.
- Figure 13.2, p. 228 – The “Epipalaeolithic” or “Early Acacus” settlement pattern.
- Figure 13.3, p. 229 – View of the eastern fringes of the Acacus Mountains, close to the Imenaneia well.
- Figure 13.4, p. 232 – View of Wadi Imha, in the central ranges of the Acacus massif.
- Plate I, p. 257 – Thin sections of soil samples.
- Plate II, p. 258 – Thin sections of soil samples.
- Plate III, p. 259 – a) The original reproduction of Wadi Kessan site, now Uan Afuda, published by Mori in 1965; b) A probably levitating male figure.
- Plate IV, p. 260 – “Round heads” paintings.
- Plate V, p. 261 – “Round heads” paintings.
- Plate VI, p. 262 – a) The Uan Afuda Cave; b) Satellite image of the Acacus mountains and surroundings.

Tables

- Table 2. I, p. 21 – Uncalibrated before present ¹⁴C datings of the excavation of Uan Afuda Cave.
- Table 2.II, p. 23 – Calibration of ¹⁴C dates using OxCal 2.18.
- Table 2.III, p. 24 – Statistical analyses of radiocarbon dates of Uan Afuda.
- Table 2.IV, p. 25 – TL and OSL dating results of the sands including Aterian artefacts.
- Table 3.I, p. 29 – Summary of field characteristics.
- Table 3.II, p. 36 – Summary of micromorphological characteristics.
- Table 5.I, p. 54 – Rock markings on the large carved boulder of Uan Afuda Cave.
- Table 6.I, p. 68 – Lithic raw materials from the “Epipalaeolithic” or “Early Acacus” layers.
- Table 6.II, p. 69 – Technological characteristics of the lithic industry from the “Epipalaeolithic” or “Early Acacus” layers.
- Table 6.III, p. 69 – Descriptive statistics of the dimensional modules of the lithic industry.
- Table 6.IV, p. 71 – Socio-technological characteristics of the lithic industry from the “Epipalaeolithic” or “Early Acacus” layers.
- Table 6.V, p. 71 – Cores from the “Epipalaeolithic” or “Early Acacus” layers.
- Table 6.VI, p. 71 – Platforms of the lithic industry from the “Epipalaeolithic” or “Early Acacus” layers.
- Table 6.VII, p. 72 – Quantity of cortex on “Epipalaeolithic” or “Early Acacus” lithic artefacts.
- Table 6.VIII, p. 72 – Typological groups of Layer 6-7.
- Table 6. IX, p. 72 – Retouched Tools of Layer 6-7.
- Table 6.X, p. 76 – Typological Groups of Layer 5-epi.
- Table 6.XI, p. 76 – Retouched Tools of Layer 5-epi.
- Table 6.XII, p. 78 – Typological Groups of Layer 7.
- Table 6.XIII, p. 78 – Retouched Tools of Layer 7.
- Table 6.XIV, p. 88 – Frequencies of potsherds and surface of fragments (in scm).
- Table 6.XV, p. 90 – Features of the rims and hypothetical diameter at the mouth of ceramics from “Mesolithic” or “Late Acacus” layers.
- Table 6.XVI, p. 90 – Vessel profiles of ceramics from “Mesolithic” or “Late Acacus” layers.
- Table 6.XVII, p. 92 – Some characteristics of the decorative technique of the pottery.
- Table 6.XVIII, p. 98 – Lithic raw materials from the “Mesolithic” or “Late Acacus” layers.
- Table 6.XIX, p. 98 – Technological characteristics of the “Mesolithic” or “Late Acacus” lithic industry.
- Table 6.XX, p. 101 – Cores from the “Mesolithic” or “Late Acacus” layers.
- Table 6.XXI, p. 103 – Platforms of the lithic artefacts from the “Mesolithic” or “Late Acacus” layers.
- Table 6.XXII, p. 103 – Quantity of cortex on “Mesolithic” or “Late Acacus” lithic artefacts.
- Table 6.XXIII, p. 106 – Socio-technological characteristics of the “Mesolithic” or “Late Acacus” lithic industry.
- Table 6.XXIV, p. 106 – Typological Groups of Layer 1.
- Table 6.XXV, p. 111 – Retouched Tools of Layer 1.
- Table 6.XXVI, p. 113 – Typological Groups of Layer 2.
- Table 6.XXVII, p. 113 – Retouched Tools of Layer 2.
- Table 6.XXVIII, p. 115 – Typological Groups of Layer 3.
- Table 6.XXIX, p. 116 – Retouched Tools of Layer 3.
- Table 6.XXX, p. 117 – Typological Groups of Layer 4.
- Table 6.XXXI, p. 117 – Retouched Tools of Layer 4.

TABLES

- Table 6.XXXII, p. 118 – Typological Groups of Layer 5-meso.
- Table 6.XXXIII, p. 118 – Retouched Tools of Layer 5-meso.
- Table 6.XXXIV, p. 121 – Grinding equipment and polished tools.
- Table 6.XXXV, p. 122 – Fragments of ostrich eggshells and finished beads.
- Table 7.I, p. 134 – Anthracological analysis.
- Table 7.II, p. 135 – Analysis of wood.
- Table 7.III, p. 139 – Uan Afuda, carpological analysis.
- Table 8.I, pp. 158-162 – Percentage pollen spectra.
- Table 8.II, p. 163 – Percentage pollen spectra: Leading and Escort pollen.
- Table 8.III, p. 170 – Percentage pollen spectra: Selected Sums.
- Table 10.I, p. 192 – Remains of plaited materials, strings and ropes from “Late Acacus” phase.
- Table 10.II, p. 198 – Length of breakage and elasticity of some natural fibres in comparison.
- Table 10.III, p. 198 – Weights, lengths and specific weight of Uan Afuda strings, compared to the data of some bast fibres and their yarns, using as examples flax and hemp.
- Table 11.I, p. 207 – Metric comparisons for Uan Afuda H2.
- Table 11.II, p. 207 – Metric comparisons for Uan Afuda H3.
- Table 12.I, p. 213 – Classification of ruminants of arid zones, according to diet and quantity of food.
- Table 12.IIa, p. 214 – Seasonal and annual relative densities of browse plants utilised by Barbary sheep.
- Table 12.IIb, p. 214 – Seasonal and annual relative densities of grass plants utilised by Barbary sheep.
- Table 12.IIc, p. 215 – Seasonal and annual relative densities of forb plants utilised by Barbary sheep.
- Table 12.III, p. 221 – Percentages of faunal remains from Early Holocene (9800-7500 bp) sites of the Tadrart Acacus.

Foreword

In assuming (November 1997) the direction of the CIRSA (Inter-University Research Center for Ancient Sahara), in the University of Rome “*La Sapienza*”, I had to face a challenge both rewarding and very hard. The former Director, prof. Fabrizio Mori, started his activities in the Libyan Sahara with a specific interest in the rock art of the famous mountain ranges of Tadrart Acacus and Messak. He started as an isolated scholar, using the logistics and technology of the time: camel caravans, tent encampments, targhi guides, personal competence and bravery, and a special taste for the prehistoric paintings and engravings — as well as for the desert landscape and the local people. Eventually he became enrolled in the University of Rome, and got more regular financial and academic support, in order to frame his own beloved topic (rock art) in the context of environmental and cultural changes in the last ten millennia. Finally, he was able to found the CIRSA and include the Libyan Sahara mission among the selected group of the so-called “*Grandi Scavi d’Ateneo*” of the Rome University. But above all he was able to establish his own prestige as the leading expert of Saharan rock art at a world-wide level. The story (a quite unique story) of his scientific activity and achievements through over half a century would deserve a treatment of its own; and somebody should take on such a treatment, before the memories start to fade out.

For a newcomer as I was (being previously engaged in the history of the ancient Near East), the challenge was not an easy one. First of all I had to make the passage of the CIRSA and the Libyan mission from a famous scholar to an outsider accepted both by the Italian academic milieu and by the Libyan authorities. Secondly, I had to take account of the epochal changes being under way in prehistoric researches in the arid zones: from the trivial facts of new logistic facilities and technical equipments, to the more and more functional inter-relationships with palaeo-environmental sciences, and even to the impending dangers brought about by an increasing tourism and by oil prospection in the Fezzan. To this end, I decided to enlarge the CIRSA from its limited pertinence to the Libyan Sahara to the entire belt of the “arid zone” both in Africa and Asia.

As for the schedule of the field and home ac-

tivities, I had both to start new projects (including those on the early historical periods with which I am more familiar), and to assume the responsibility of former campaigns which had remained largely unpublished. To this end, the decision to start a new series of monographs (AZA = Arid Zone Archaeology) aims at providing the appropriate editorial tool: and all the scholars and missions working in similar environments with similar ends (basically, to put the remains of ancient cultures in their palaeo-environmental context) are warmly invited to consider the new AZA series as open to international use.

The first volume of the AZA monographs fits quite properly in our projects. The Uan Afuda Cave had attracted the attention of prof. Mori since his early trips in the Acacus; it has been excavated by Dr Savino di Lernia in 1993-94, still under Mori’s direction. Dr di Lernia, a former collaborator of prof. Mori, is by now a “veteran” member of the mission, within which he plays a pivotal role. The work carried on in Uan Afuda Cave is characterized by a full use of the inter-disciplinary approach, and provides sound and important results on the “pre-pastoral” cultures and on the environment of the Fezzan during the Early Holocene. I am happy that this volume marks the beginning of our program of publications of former campaigns by the CIRSA mission, and the beginning of the AZA series. More volumes are being prepared, related both to specific sites (where archaeological soundings have been carried on) and to the extensive surveys (by prof. Mauro Cremaschi and Dr Savino di Lernia) which cover by now the entire Acacus range and the surrounding ergs. I wish to thank here the Advisory Board of this volume, colleagues involved in African archaeology and specialists in the topics faced by Dr di Lernia and associates: Carla A. Accorsi, Isabella Caneva, Katharina Neumann, Andrew B. Smith, George Stoops.

I am especially indebted to the University of Rome “*La Sapienza*”, to its president prof. Giuseppe D’Ascenzo, and to its committee for scientific research, for providing us with the necessary funds. Other funds came from the Italian CNR and from the Italian Ministry of Foreign Affairs. The Libyan Directorate for Antiquities, and its Director General Dr Ali Muhammad

Khadduri, deserve a special thank for providing not only the necessary formal agreements, and not only the personal participation of Libyan colleagues in our missions (the CIRSA mission to the Acacus and Messak is in fact a joint Italo-Libyan expedition), but also and especially the friendly atmosphere which makes our work in Libya particularly agreeable and effective.

In dedicating this volume to prof. Fabrizio Mori, we — Dr di Lernia and the other authors of the book, as well as myself — are simply ac-

knowledging an obvious fact: without Mori's scientific achievements, without his prestige in Libya and in the entire world, without his ideas and teachings (both at the academic level and in personal intercourse), the activities of the CIRSA would not exist at all. And this holds true not only of past activities, but also of those going on in the present and projected into the future.

MARIO LIVERANI
AZA Series Editor

Commentary

The Italian interests in the Acacus Mountains continue to produce exciting results that started with Fabrizio Mori's seminal work in 1955. Uan Afuda Cave has provided the opportunity for Savino di Lernia and his colleagues with a window into the human life of the Late Pleistocene Aterian hunters, as well as important phases of the Early Holocene before domestication was evident in this part of the Sahara. The dating of the Aterian adds to previous work done in the Sahara, and suggests an occupation between 90-60,000 years ago. Like all dating methods beyond the range of ^{14}C dating, there is the problem of controlling for the environment. This often leads to disparities between different laboratories. However, the dates obtained from Uan Afuda are consistent with other dates for later African Middle Stone Age industries, both in North and South Africa.

The Early Holocene is divided into two cultural periods: "Early Acacus" equivalent to the "Epipalaeolithic", and "Late Acacus", a local name for the "Mesolithic". It is this sequence which offers considerable insight into lives of hunters before domestication occurred. Because the cave has both an inner and outer section, each of these spatial divisions has offered information on differential activities in both areas. An exciting find was the considerable dung layer in the Mesolithic that could only have come from keeping animals in the cave for some time.

In 1976, E.C. Saxon analyzed the bones from Tamar Hat in Algeria, and noted the inordinate number of *Ammotragus* bones in the assemblage. From this he concluded that attempts at domestication were being practised. Saxon was part of the Higgs group from Cambridge which broke new ground on the origins and consequences of animal domestication. The paradigm of the 1970s did not really consider control and experimentation with animals that may have had nothing to do with domestication, and this mindset still continues to exist in research into early cattle domestication in the Western Desert of Egypt in the 1990s.

Dr di Lernia and his colleagues in this work have offered a new breakthrough in the devel-

opmental model. This has been accomplished through a multi-disciplinary team carefully analyzing the botanical, faunal and cultural remains within the context of the cave and its palaeoenvironment.

Like at Tamar Hat, at Uan Afuda the dominant animal species is *Ammotragus*, but rather than assume that this was an attempt at domestication (manipulation of genetic material), they looked at what the different strands of evidence had to say. The results of this work and their interpretation is what was happening in the "Late Acacus" or "Mesolithic" period was an attempt to control the animals, by penning them in the cave, seen in the considerable dung layer and plant remains that were intentionally brought into the cave by humans to feed the animals. An additional floral element was that of *Echium*, a plant poisonous to sheep. The introduction of this plant seems to have been intentional, but the question remains: was the quantity sufficient to actually kill the animals? An alternative idea might be that the toxic plant was being used as a soporific, to keep skittish animals under control, much the same as Turkish farmers appear to do today when they feed their sheep willow leaves. Such control over the animals has been placed within an explanatory framework that attempts to understand the social changes that might have taken place, in particular by the use of the animals in ritual. These rituals were recorded on the walls of the caves of the Acacus Mountains to produce the earliest painted rock art, known as the "Round Heads".

The team under Dr di Lernia's organisation is to be congratulated of its painstaking analysis, and methodical description/interpretation to allow each strand of evidence to speak for itself as an independent variable. This way they have built up a well-argued case for activities of people who not only knew the resources they were exploiting intimately, but who were able to control these to the point of entering the "delayed return" end of the hunting subsistence continuum.

ANDREW B. SMITH
University of Cape Town