Technical Reports of the Australian Museum, Online

a peer-reviewed, open-access, serial publication of the
Australian Museum Research Institute
1 William Street, Sydney NSW 2010

ISSN 1835-4211 (online)
https://doi.org/10.3853/issn.1835-4211

Number 27 · 19 December 2018

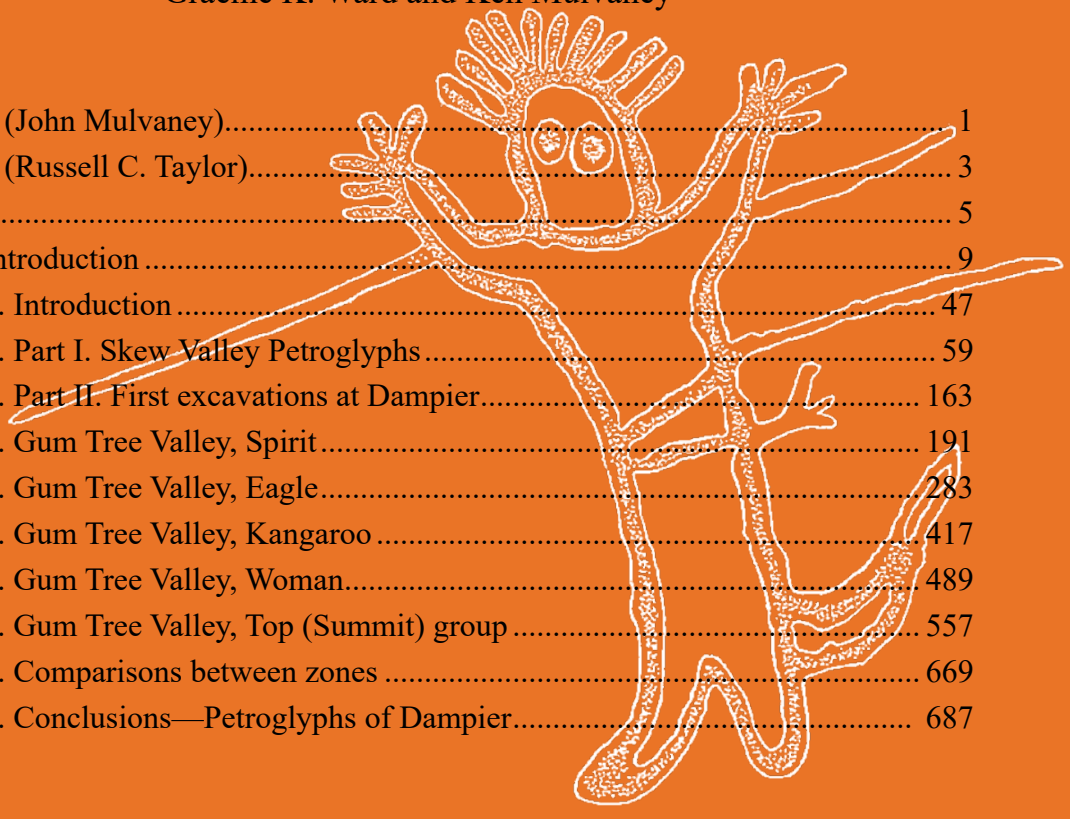
Archaeology and Petroglyphs of Dampier (Western Australia)
an Archaeological Investigation of Skew Valley and Gum Tree Valley

by

Michel Lorblanchet

edited by

Graeme K. Ward and Ken Mulvaney



Published by the Australian Museum, Sydney, Australia.
The Australian Museum is a statutory authority of,
and principally funded by, the NSW State Government.

Lorblanchet, Michel, 2018. *Archaeology and Petroglyphs of Dampier (Western Australia), an Archaeological Investigation of Skew Valley and Gum Tree Valley*, ed. Graeme K. Ward and Ken Mulvaney. *Technical Reports of the Australian Museum, Online* 27: 1–690.

[Published online-only by the Australian Museum, Sydney, as 14 PDF, the bibliographic details for which are listed below. A contents table at the beginning of each one of the 14 PDFs has DOI links interconnecting all works in this volume.]

Mulvaney, Derek John, 2018. Petroglyphs of Dampier—foreword. In Archaeology and Petroglyphs of Dampier (Western Australia), an Archaeological Investigation of Skew Valley and Gum Tree Valley, ed. Graeme K. Ward and Ken Mulvaney, pp. 1–2. *Technical Reports of the Australian Museum, Online* 27: 1–690.
https://doi.org/10.3853/j.1835-4211.27.2018.1684

Taylor, Russell C., 2018. Petroglyphs of Dampier—foreword. In *Archaeology and Petroglyphs of Dampier (Western Australia), an Archaeological Investigation of Skew Valley and Gum Tree Valley*, ed. Graeme K. Ward and Ken Mulvaney, p. 3. *Technical Reports of the Australian Museum, Online* 27: 1–690.
https://doi.org/10.3853/j.1835-4211.27.2018.1685

Ward, Graeme K., 2018. Petroglyphs of Dampier—preface. In *Archaeology and Petroglyphs of Dampier (Western Australia), an Archaeological Investigation of Skew Valley and Gum Tree Valley*, ed. Graeme K. Ward and Ken Mulvaney, pp. 5–8. *Technical Reports of the Australian Museum, Online* 27: 1–690.
https://doi.org/10.3853/j.1835-4211.27.2018.1686

Ward, Graeme K., and Ken Mulvaney, 2018. Archaeology and petroglyphs of Dampier—editors' introduction. In *Archaeology and Petroglyphs of Dampier (Western Australia), an Archaeological Investigation of Skew Valley and Gum Tree Valley*, ed. Graeme K. Ward and Ken Mulvaney, pp. 9–45. *Technical Reports of the Australian Museum, Online* 27: 1–690.
https://doi.org/10.3853/j.1835-4211.27.2018.1687

Lorblanchet, Michel, 2018a. General introduction to the research at Dampier. In *Archaeology and Petroglyphs of Dampier (Western Australia), an Archaeological Investigation of Skew Valley and Gum Tree Valley*, ed. Graeme K. Ward and Ken Mulvaney, chapter 1, pp. 47–58. *Technical Reports of the Australian Museum, Online* 27: 1–690.
https://doi.org/10.3853/j.1835-4211.27.2018.1688

Lorblanchet, Michel, 2018b. The Petroglyphs of Skew Valley. In *Archaeology and Petroglyphs of Dampier (Western Australia), an Archaeological Investigation of Skew Valley and Gum Tree Valley*, ed. Graeme K. Ward and Ken Mulvaney, chapter 2 (part I), pp. 59–161. *Technical Reports of the Australian Museum, Online* 27: 1–690.
https://doi.org/10.3853/j.1835-4211.27.2018.1689

Lorblanchet, Michel, and Rhys Jones, 2018. The first excavations at Dampier (Western Australia), and their place in Australian archaeology (with addendum on radiocarbon dating of Skew Valley midden). In *Archaeology and Petroglyphs of Dampier (Western Australia), an Archaeological Investigation of Skew Valley and Gum Tree Valley*, ed. Graeme K. Ward and Ken Mulvaney, chapter 2 (part II), pp. 163–190. *Technical Reports of the Australian Museum, Online* 27: 1–690.
https://doi.org/10.3853/j.1835-4211.27.2018.1690

Lorblanchet, Michel, 2018c. The Spirit Figure Group at Gum Tree Valley. In *Archaeology and Petroglyphs of Dampier (Western Australia), an Archaeological Investigation of Skew Valley and Gum Tree Valley*, ed. Graeme K. Ward and Ken Mulvaney, chapter 3, pp. 191–282. *Technical Reports of the Australian Museum, Online* 27: 1–690.
https://doi.org/10.3853/j.1835-4211.27.2018.1691

Lorblanchet, Michel, 2018d. The Eagle Group at Gum Tree Valley. In *Archaeology and Petroglyphs of Dampier (Western Australia), an Archaeological Investigation of Skew Valley and Gum Tree Valley*, ed. Graeme K. Ward and Ken Mulvaney, chapter 4, pp. 283–416. *Technical Reports of the Australian Museum, Online* 27: 1–690.
https://doi.org/10.3853/j.1835-4211.27.2018.1692

Lorblanchet, Michel, 2018e. The Kangaroo Group at Gum Tree Valley. In *Archaeology and Petroglyphs of Dampier (Western Australia), an Archaeological Investigation of Skew Valley and Gum Tree Valley*, ed. Graeme K. Ward and Ken Mulvaney, chapter 5, pp. 417–488. *Technical Reports of the Australian Museum, Online* 27: 1–690.
https://doi.org/10.3853/j.1835-4211.27.2018.1693

Lorblanchet, Michel, 2018f. The Woman Group at Gum Tree Valley. In *Archaeology and Petroglyphs of Dampier (Western Australia), an Archaeological Investigation of Skew Valley and Gum Tree Valley*, ed. Graeme K. Ward and Ken Mulvaney, chapter 6, pp. 489–555. *Technical Reports of the Australian Museum, Online* 27: 1–690.
https://doi.org/10.3853/j.1835-4211.27.2018.1694

Lorblanchet, Michel, 2018g. The Summit of Gum Tree Valley. In *Archaeology and Petroglyphs of Dampier (Western Australia), an Archaeological Investigation of Skew Valley and Gum Tree Valley*, ed. Graeme K. Ward and Ken Mulvaney, chapter 7, pp. 557–668, with addenda by Jacques Evin and George Kendrick. *Technical Reports of the Australian Museum, Online* 27: 1–690.
https://doi.org/10.3853/j.1835-4211.27.2018.1695

Lorblanchet, Michel, 2018h. Comparisons between the six zones studied in Skew Valley and Gum Tree Valley. In *Archaeology and Petroglyphs of Dampier (Western Australia), an Archaeological Investigation of Skew Valley and Gum Tree Valley*, ed. Graeme K. Ward and Ken Mulvaney, chapter 8, pp. 669–686. *Technical Reports of the Australian Museum, Online* 27: 1–690.
https://doi.org/10.3853/j.1835-4211.27.2018.1696

Lorblanchet, Michel, 2018i. Petroglyphs of Dampier—general conclusions. In *Archaeology and Petroglyphs of Dampier (Western Australia), an Archaeological Investigation of Skew Valley and Gum Tree Valley*, ed. Graeme K. Ward and Ken Mulvaney, chapter 9, pp. 687–690. *Technical Reports of the Australian Museum, Online* 27: 1–690.
https://doi.org/10.3853/j.1835-4211.27.2018.1697

Author

Michel Lorblanchet joined the *Centre national de la recherche scientifique* (CNRS, France) in 1969 to study the Palaeolithic rock art of France. After graduating in 1972 from Université Sorbonne (Paris) with a doctorate in Prehistory, he was employed from 1974 to 1977 at the Australian Institute of Aboriginal Studies to conduct research into indigenous Australian rock art. From his base in Canberra, he participated in projects in Far North Queensland and in western Victoria. Between 1975 and 1976, he conducted the fieldwork at Dampier, Western Australia, on which this monograph is based, and made two further fieldtrips there in 1983 and 1984. He returned to France in 1977 to the *Centre de Préhistoire du Pech Merle* (Cabrerets). Lorblanchet was appointed *Directeur de recherches au CNRS* in 1995; he retired in 1999 and lives near Saint Sozy in the Lot Valley where he continues to research and publish about rock art. He is the author of many papers and several books on European Palaeolithic art (some are listed in the editors' introduction) as well as reports and this monograph on his Australian researches.

Volume Editors

Graeme K. Ward has conducted archaeological and ethno-archaeological fieldwork in the island Pacific and Australia. He gained his doctorate from The Australian National University and was employed at the Australian Institute of Aboriginal Studies where he was involved with administration of research programs including the national Rock Art Protection Program. Subsequently, as Research Fellow and Senior Research Fellow at the Australian Institute of Aboriginal and Torres Strait Islanders Studies he undertook research into Indigenous cultural landscapes in northern Australia with traditional knowledge-holders of cultural heritage places. He is the author of various research papers, of three monographs and editor of many collections of archaeological papers; he served as the editor of the Institute's journal, *Australian Aboriginal Studies*, for several years. Currently he is a visitor at the Department of Archaeology and Natural History, School of Culture, History and Language, College of Asia and the Pacific, of The Australian National University.

Ken Mulvaney has lived and worked for the past ten years on the Burrup Peninsula, where he is the Principal Advisor Cultural Heritage for Rio Tinto Iron Ore. Prior to this, Ken spent many years in the Northern Territory working with Aboriginal traditional owners documenting their cultural heritage places and land affiliations. He first came to the Burrup in 1980 when employed by the Western Australian Museum as member of a team documenting archaeological sites in areas destined for construction of a petrochemical processing plant. His doctorate from the University of New England is the first such study on the prehistory of the Dampier Archipelago. He is author of many articles on rock art and Aboriginal culture, and is currently affiliated with the Centre for Rock Art Research and Management, University of Western Australia.

Chapter 7
Summit of Gum Tree Valley

Technical Reports of the Australian Museum, Online (2018) No. 27, pp. 557–668.
ISSN 1835-4211 (online)
https://doi.org/10.3853/j.1835-4211.27.2018.1695

The Summit of Gum Tree Valley[1]

Michel Lorblanchet

Directeur de Recherches au CNRS (Centre National de la Recherche Scentifique, retired 1999),
Centre de Préhistoire du Pech Merle, Cabrerets, France, and, during the studies reported here:
Australian Institute of Aboriginal Studies, Canberra, Australia (1974–1977)

Lorblanchet, Michel. 2018. The Summit of Gum Tree Valley. In *Archaeology and Petroglyphs of Dampier (Western Australia), an Archaeological Investigation of Skew Valley and Gum Tree Valley*, ed. Graeme K. Ward and Ken Mulvaney, chapter 7, with addenda by Jacques Evin and George Kendrick, pp. 557–668. *Technical Reports of the Australian Museum, Online* 27, pp. 1–690. https://doi.org/10.3853/j.1835-4211.27.2018.1695

The Gum Tree Valley Top Group

The group called 'Gum Tree Valley Top' occupies the zone uphill from the valley right up to its eastern extremity—the Summit of Gum Tree Valley. Stretching over 270 m in length, it reaches as far as the saddle, which is 70 m in altitude. This overlooks the marshy areas of Fenner Creek that are accessible by a steep ravine that falls sharply away to the East (Figs 7.1–7.4).

This part of the valley becomes much narrower and, at the bottom of the slope, the width is reduced to about 10 m (Fig. 7.1). Here, there is a considerable increase in the incidence of carvings (which appear at the start of this narrowing). All the carved surfaces were itemized and photographed, and almost all were traced, using the methods described earlier (Chapter 1: *Methodology*).

My study of the 105 carved surfaces resulted in recordings of 418 graphic units; all were examined in detail. Artefacts (379 stone tools and flakes) were listed, described and plotted on a map and left as found on the site. The same was done for about 50 shells. The overall map of the site (Fig. 7.4) shows the locations of the carved blocks, which are numbered from 1–102; the incidence of the stone artefacts, numbered from 1–379; and the small mass of shell fragments (300 g in all).

The comparison of density curves (according to Jekhowsky's (1964) method) of the carvings, artefacts, and shell fragments produced the following results (Fig. 7.5):

1 The majority (73%) of the carved blocks is situated on the southern slopes, and the remainder on the northern slopes. This contrast between the number of carvings on the northern and southern slopes also was found in other areas of Gum Tree Valley. The southern faces, which get more sunshine, have the larger proportions of carvings. This observation supports the idea that the site was mostly frequented during the winter months (we will return to this), whereas in summer, the heat plus the radiation from the rocks made a stay of any length of time unbearable at the bottom of the valley;

2 The distribution of the carved blocks across 12 heterogeneous groups of various carvings (I to XII) is shown in Table 7.1. Groups I and II, at the centre of the site, are the most compact. The first group stretches over 30 m around an artificial mound and a standing stone (Panel 10 {p. 623}). It is made up of 29 carved blocks. The second cluster is situated about 50 m east of the former, and is a small group of about 12 m in length, consisting of only 12 carved slabs. All groups are listed in Table 7.1. A few carvings are set apart (Figs 7.4 and 7.7). Panel 29 {p. 634} is at the far eastern end of the summit; Panel 68 {p. 654} is halfway up the southern slope, and Panel 82 {p. 660} on the northern slope; and

3 Artefacts are most numerous in the bottom of the thalweg (the longitudinal outline of the dry riverbed) at the foot of the slopes, but they are present also in the fissures and gaps between the carved blocks. Their distribution, which is heterogeneous, reproduces almost exactly that of the carvings (Fig. 7.5). There are seven distinct clusters. Clusters A and C, the most important, correspond to Group I of the carvings, which is also the densest.

Artefact Clusters B, D, E and F correspond respectively to the carvings Groups V, II, VI and III (Fig. 7.5). Cluster G is small, and only noticeable by an indentation in the density

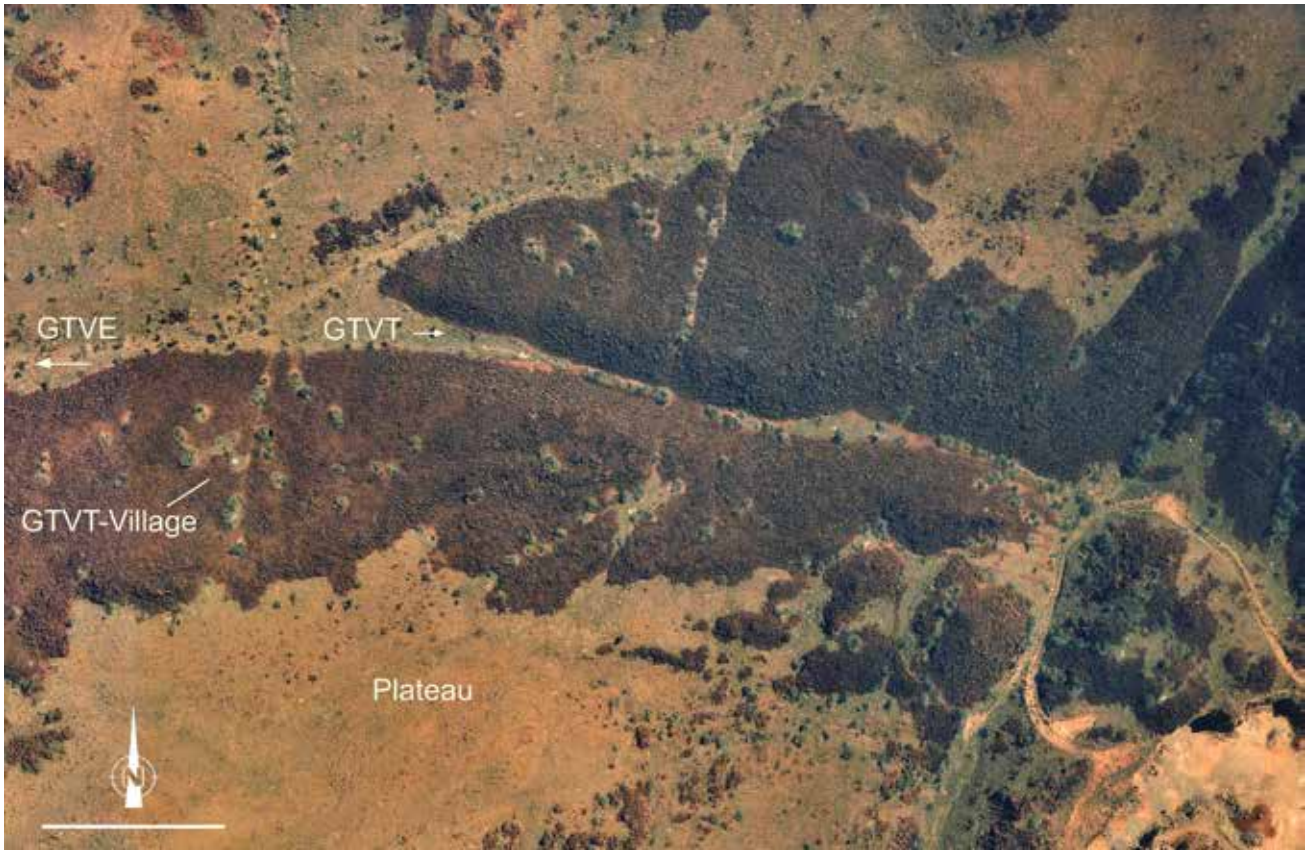


Figure 7.1. GTVT. Aerial view showing locations of GTVT, 'GTVT village', and plateau. North at top of photograph. Scale 100 m.

Figure 7.2. GTVT. General view of Top group. White arrow indicates carved boulder (GTVT-38) in middle of valley.

curves; it coincides exactly with the location of Group X. This conformity is emphasized by sections of the density maps (Fig. 7.6). These correlations, both of topographical and numerical plots, reflect the fact that the most important groups of stone pieces correspond to the densest group of carvings and reveal that *the carvings and artefacts are associated*.

On the other hand, the shell scatters appear to have no significant connection with the distributions of carvings and artefacts. Indeed, the shells are scattered all along the thalweg and are in their greatest numbers at the two ends of the zone, in the areas where there are very few carvings and artefacts (cf. Fig. 7.5).

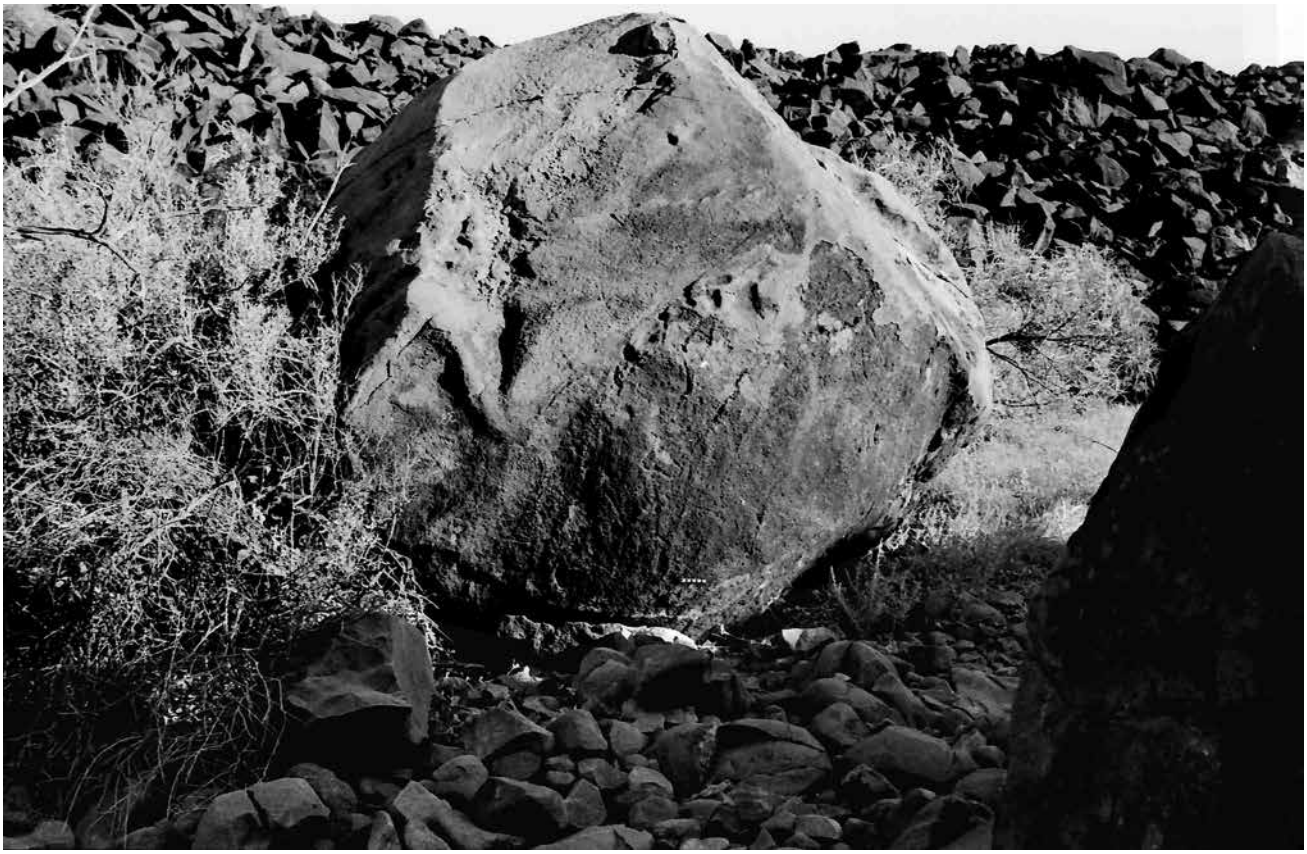


Figure 7.3. GTVT-38. Large carved boulder in the thalweg of the valley.

Table 7.1. GTVT. Number of carved blocks by Group.

group	number of carved blocks	carved blocks numbered
I	29	2, 6–15, 19–24, 85, 94–101
II	12	52–62, 65
III	8	33–37, 39, 40, 44
IV	6	18, 25, 27, 79, 102
V	5	15–17, 69, 83
VI	5	45–49
VII	3	41–43
VIII	3	28, 31, 32
IX	2	77, 78
X	7	70–76
XI	4	86–88, 90
XII	3	30, 80, 81

The Top Group petroglyphs

Various themes in the depictions

At GTVT, I recorded a varied range of motifs and these are similar to those found at other groups in Gum Tree Valley. A total of 418 graphic units was recorded; Table 7.2 lists the motifs identified among the petroglyphs at the top of Gum Tree Valley, and the Appendix accompanying this chapter, provides illustrations of many of the motifs recorded.[2]

The various themes identified and their occurrences among the petroglyphs at the top of Gum Tree Valley are listed in Table 7.3. The distributions of various motif categories on the

Table 7.2. GTVT. Motif inventory.

	number	percent	sum
'human' figures			
'humans'	68	16.2	
'coital scene'	2	0.5	
'hand'	2	0.5	
'foot'	2	0.5	17.7
'animal' figures			
'kangaroo'	10	2.3	
'bird'	3	0.7	
'snake'	2	0.5	
'turtle'	5	1.1	
'fish'	2	0.5	
indeterminate 'animal'	3	0.7	5.8
'animal tracks'			
'kangaroo tracks'	14	3.3	
'bird tracks'	6	0.5	4.8
geometric patterns			
circular form	17	4.0	
arc-like form	11	2.6	
bi-lobed form	6	0.5	
oval form	12	2.8	
linear form	20	4.7	
punctations (dots)	189	45.0	
other geometric form	1	0.5	60.1
indeterminate	43	10.2	10.2
total graphic units	418	98.6	98.6

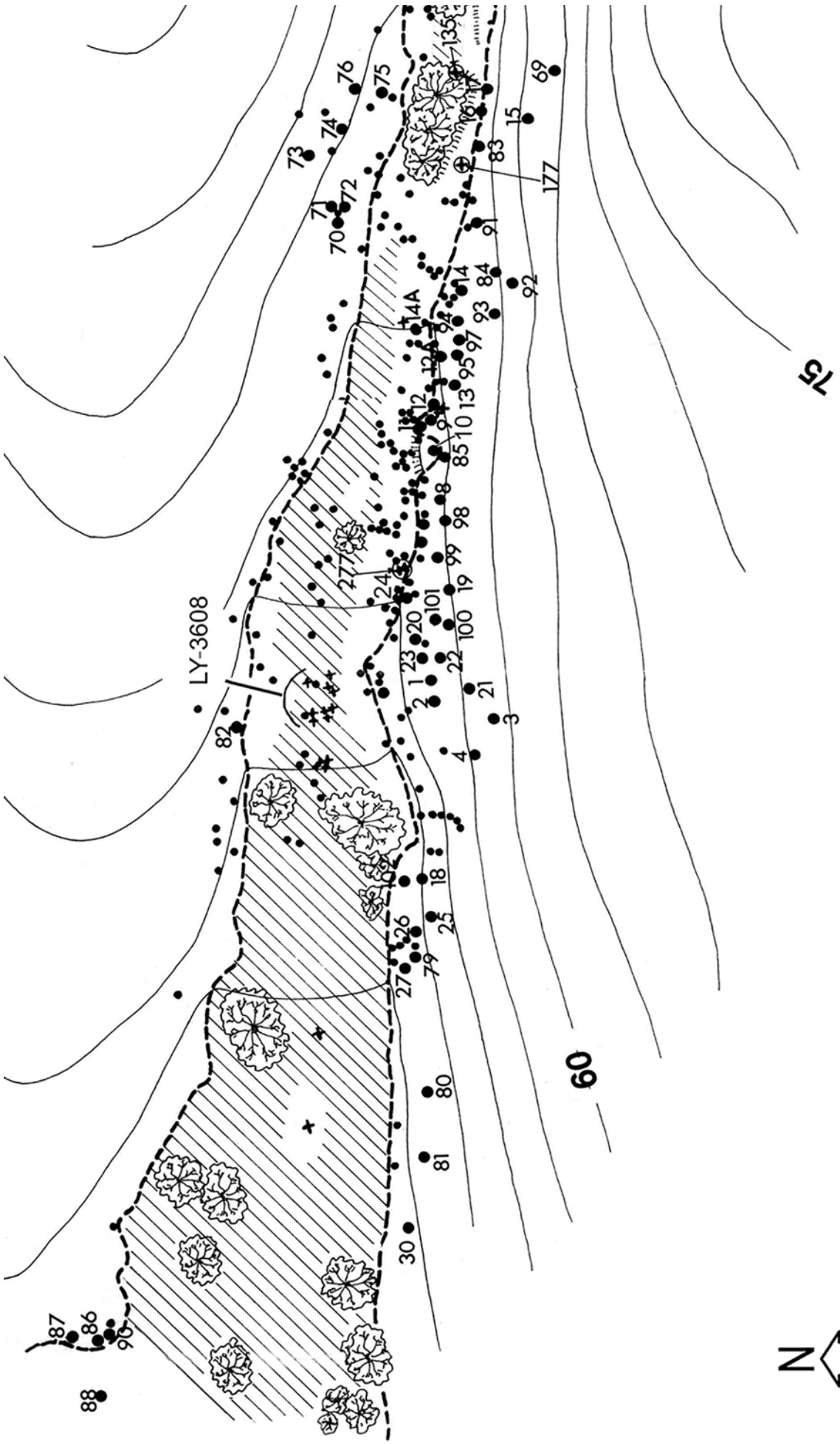


Figure 7.4. GTVT. General map of Gum Tree Valley Top Group (right half on next page). Scale: 10 m. Key: ● = carved rock (numbered); • = artefact, shell; hatched = area with soil and grass cover; LY- … = location of sample for radiocarbon analysis (figure continues on next page).

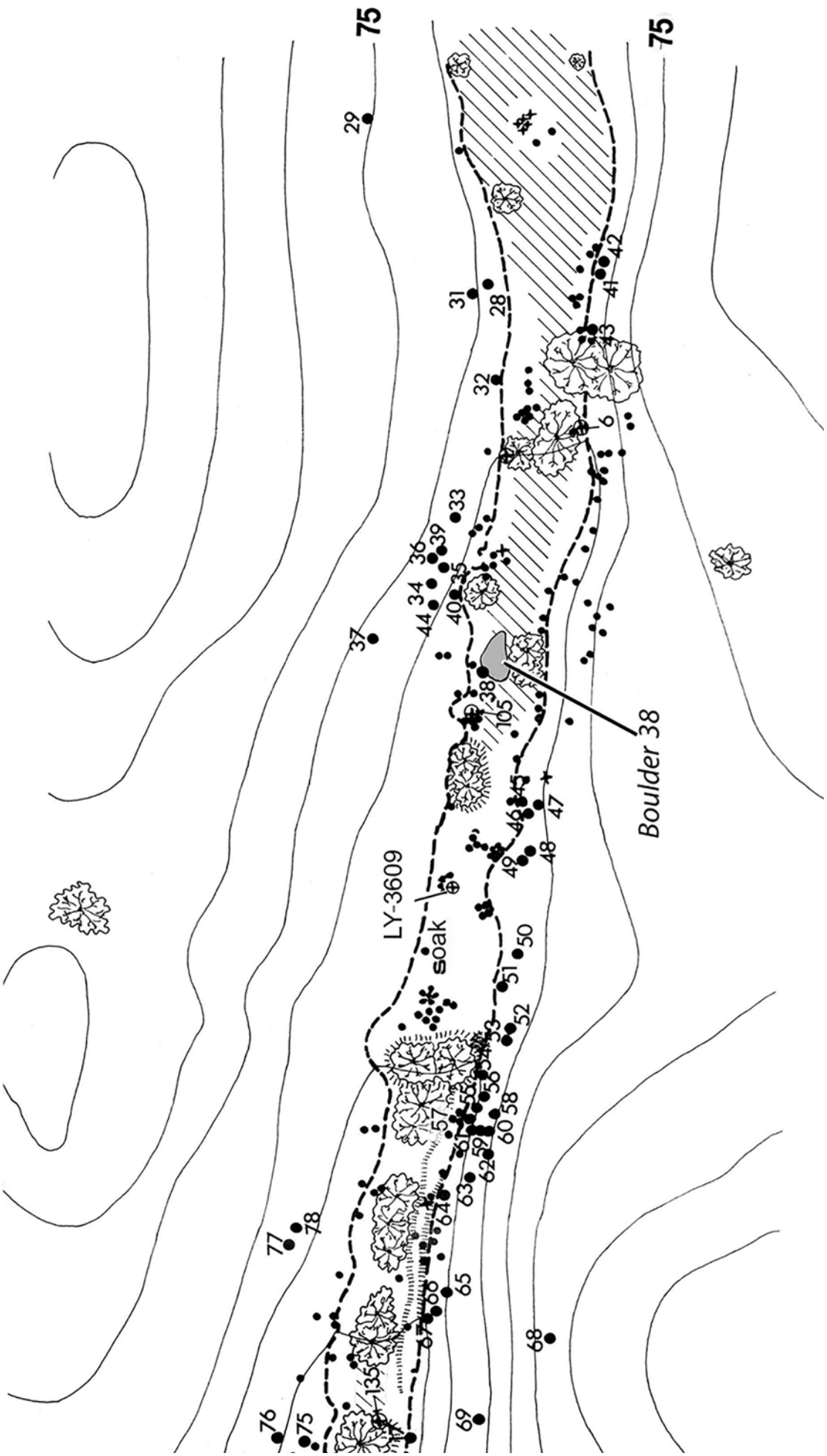
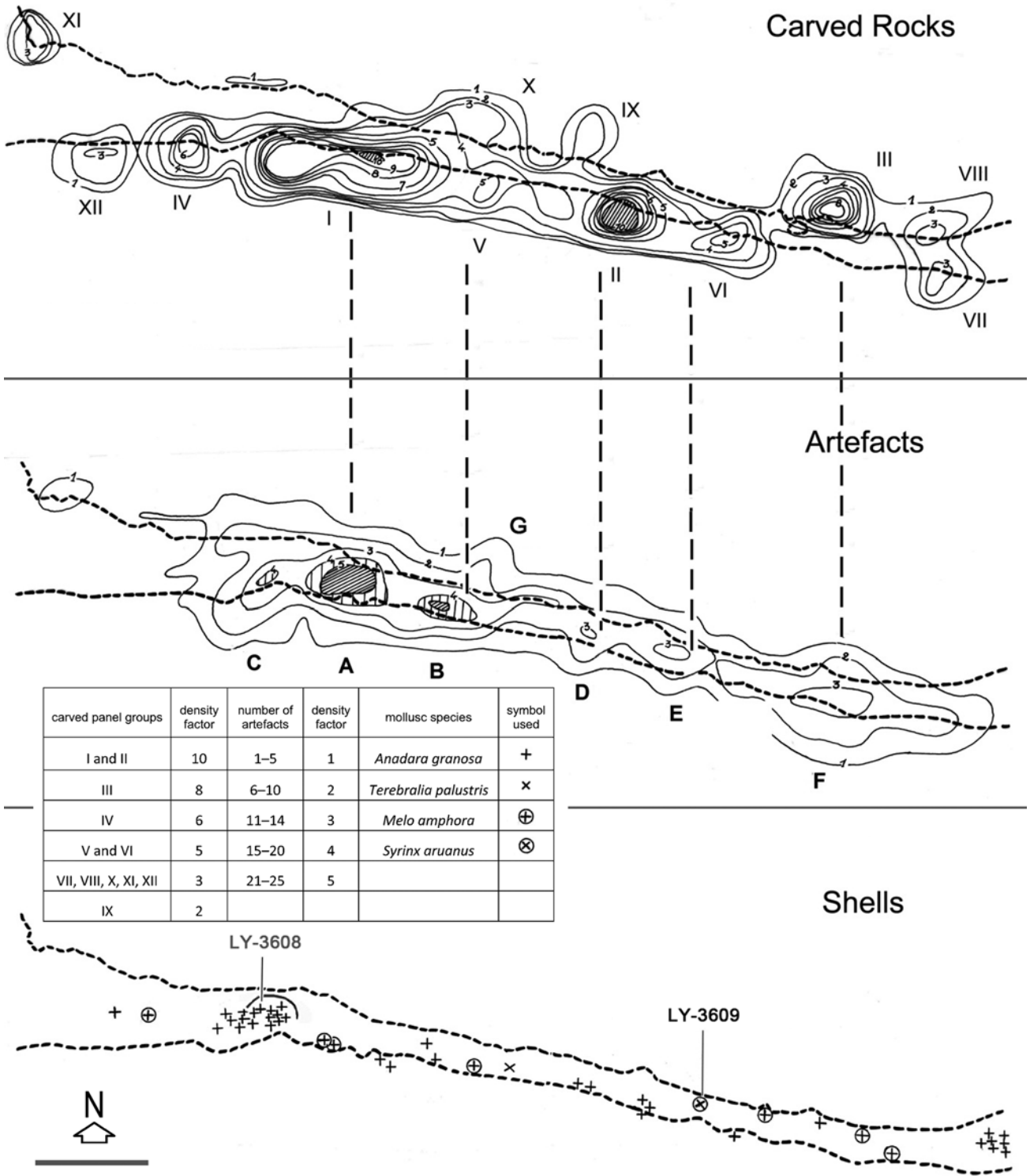


Figure 7.4 (continued). GTVT. General map of Gum Tree Valley Top Group (left half on previous page). Scale: 10 m. Key: ● = carved rock (numbered); • = artefact, shell; hatched = area with soil and grass cover; LY- … = location of sample for radiocarbon analysis.



carved panel groups	density factor	number of artefacts	density factor	mollusc species	symbol used
I and II	10	1–5	1	*Anadara granosa*	+
III	8	6–10	2	*Terebralia palustris*	×
IV	6	11–14	3	*Melo amphora*	⊕
V and VI	5	15–20	4	*Syrinx aruanus*	⊗
VII, VIII, X, XI, XII	3	21–25	5		
IX	2				

Figure 7.5. GTVT. Maps of the densities of the carved surfaces (upper), artefacts (middle) and shells (lower). Scale: 30 m.

105 numbered surfaces are given in Table 7.4. The typology of the petroglyphs is summarized in a table and figure in the concluding section (Chapter 8).

Depictions of humans

'Human' figures are the most numerous motifs at Gum Tree Valley Top. A total of 68 were recorded. They were found most frequently in the central part and on the southern slope (Motif Group II). Three different categories can be distinguished, 'ghost-like figures', 'stick figures', and a 'miscellaneous' category.

'Ghost-like' figures

The best examples of 'ghost-like' figures recorded at the Top of Gum Tree Valley are Motifs GTVT-1 {p. 617} and -64 {p. 651} (Fig. 7.8). Eighteen of this category were counted. They are mainly clustered in the centre (GTVT-1 {p. 617}, -2, -6 {p. 619}, -7 {p. 620}, -15 {p. 627} to -17 {p. 628}, -27 {p. 633}, -29 {p. 634}, -50 {p. 646}, -64 {p. 651}, -65 {p. 653}, -79 {p. 659}, -86 {p. 661}, -96 {p. 666}).[3] They are often large figures, lengths exceeding 2 m (Table 7.5). The most characteristic of these figures are the tallest ones.

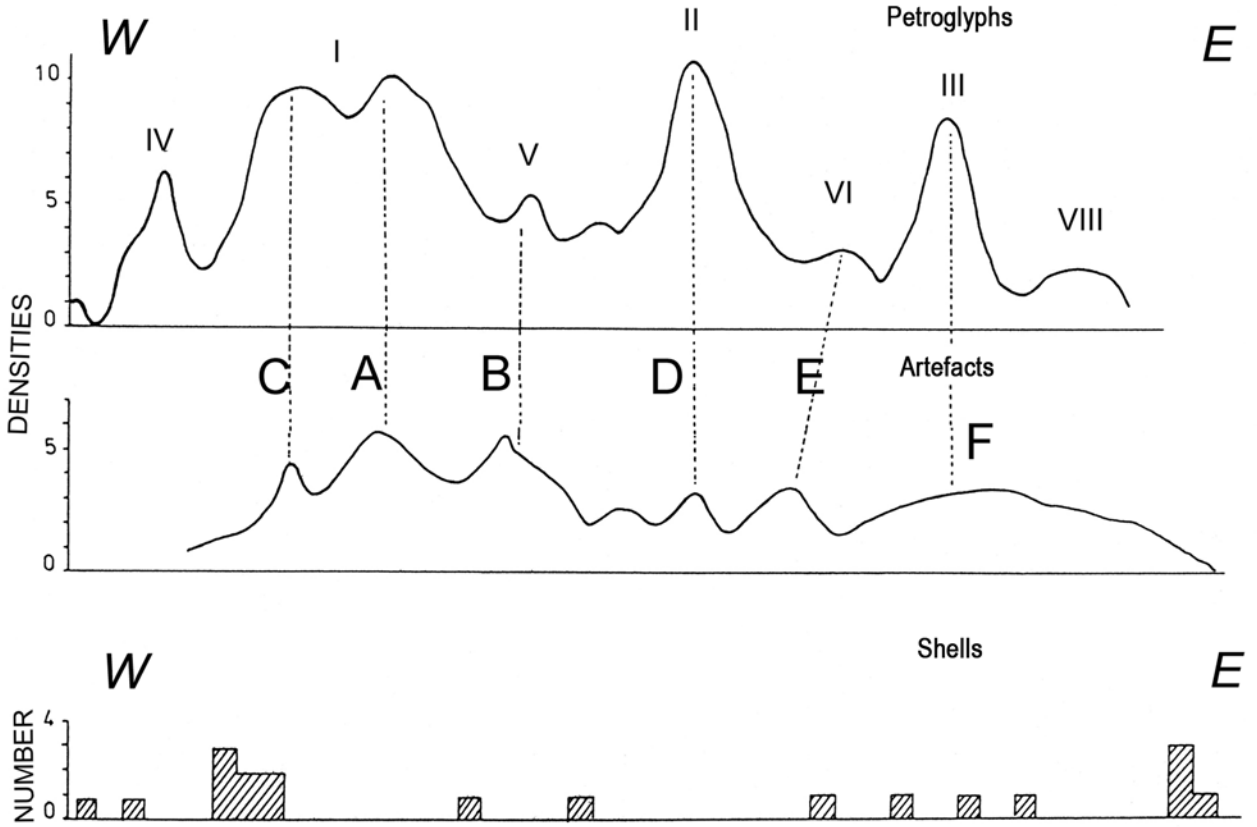


Figure 7.6. GTVT. Cross-sections of the density distributions of the petroglyphs, artefacts and shells.

Table 7.3. GTVT. Occurrences of themes among the carved figures.

themes	numbers of panels with given motif	percentage appearance of the theme	sum
'human' figures			
'humans'	39	24.22	
'coital scene'	2	1.24	
'hand'	2	1.24	
'foot'	3	1.86	28.56
'animals' figures			
'kangaroo'	8	4.96	
'bird'	3	1.86	
'snake'	2	1.24	
'turtle'	4	2.48	
'fish'	1	0.62	11.16
'animal tracks'			
'kangaroo tracks'	5	3.10	
'bird tracks'	5	3.10	6.20
geometric patterns			
circular form	4	2.48	
arc-like form	6	3.72	
bi-lobed form	4	2.48	
oval form	10	6.21	
linear form	15	9.31	
punctations (dots)	23	14.28	38.48
indeterminate	25	15.52	15.52
total	161		99.92

The big rounded 'heads', without 'neck', of the 'ghost-like' motifs resemble a cosmonaut or diver's helmet. The 'eyes', made of two big cupules, appear on three figures only. The 'mouth' is never represented and the 'nose' is represented in just one instance. The 'body' is large; the 'limbs' are reduced to simple off-shoots of the outline or to just simple lines. 'Hands' are found on only two figures. The outline was obtained by linear pecking forming big separate dots. Only rarely are areas of joined pecked dots associated with linear pecking (Fig. 7.8: 1, 7, 86; Fig. 7.9).

Eight are depicted as 'male'. The form of the 'genitalia' is varied: sometimes a simple line (GTVT-86 {p. 661}). sometimes so exaggerated that it could make the identification of the figure difficult (GTVT-27 {p. 633}). Two are depicted as 'female'; however, 'breasts' are never represented, two lines or a curl seem to depict the 'vulva' (Fig. 7.8: 7 and especially 17). In four cases 'gender' is not indicated.

GTVT-16 {p. 628} (Fig. 7.8) deserves special attention: In the centre of the group, on the edge of the thalweg, it captures the view of any passer-by. With a height of 2.15 m, it is the tallest figure on the site. The lower 'limbs' were drawn by linear pecking with separate dots, while the 'body' and the upper part are entirely pecked with joined dots (intaglio). Fourteen lines, probably depicting spears, are stuck in different places of the 'body', in the 'head' and in the single depiction of an 'arm'. The top of the 'head', which resembles that of the 'ghost-like' figures, is ornamented with three diverging lines, representing perhaps a ceremonial headdress.

On the right side of the motif, above the 'thigh', there are visible two long parallel lines joined together at their extremities on the edge of the slab. These probably represent an exaggerated penis (660 mm long), in a lateral position,

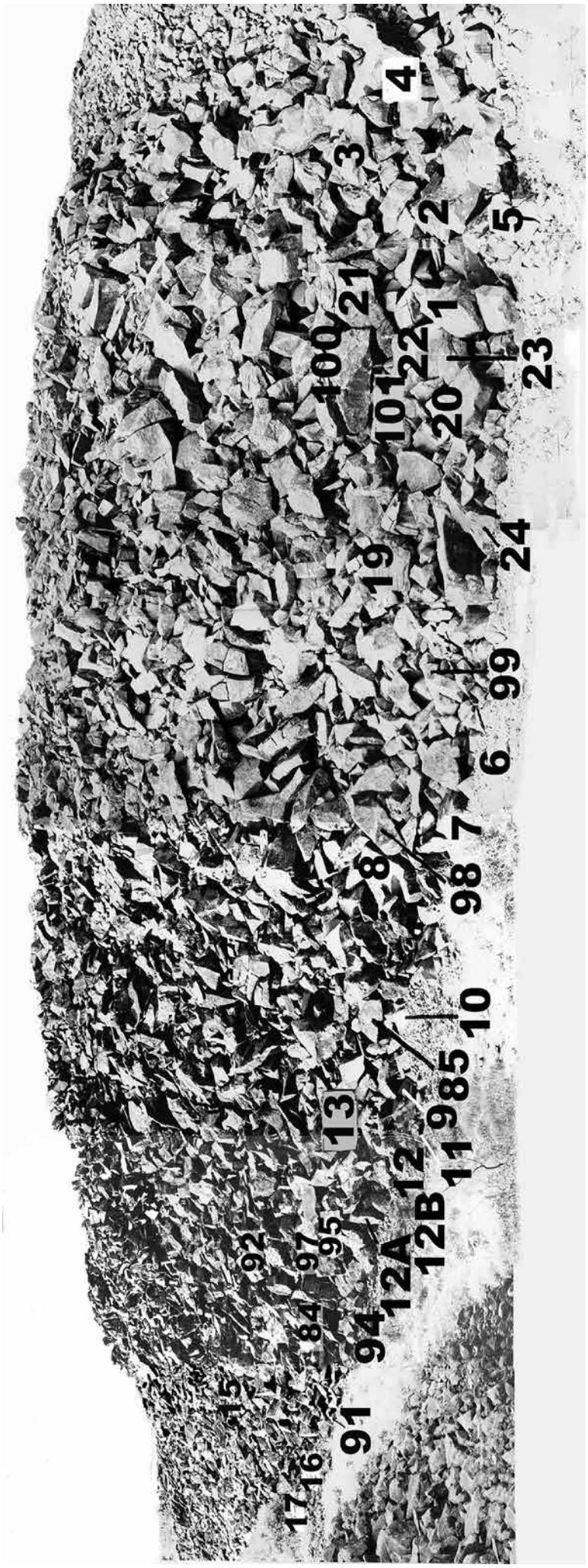


Figure 7.7. GTVT. The summit of Gum Tree Valley: one part of the southern slope (the carved rocks are numbered on the photograph in order readily to find them on the site map, Fig. 7.4).

as is frequent in Dampier and Pilbara petroglyphs. All the lines of the figure are deeply patinated. However, a second smaller 'penis' (290 mm long), with a forked end, is placed between the 'legs' of the figure. It is a later addition, looking fresher than the original motif; it was made by fine pecking or hammering. The figure occupies the whole surface of an elongated slab. It is associated with 31 dots and eight small pecked circles.

There are two examples of depiction of coitus: GTVT-15 {p. 627} and -65 {p. 653} are characteristic representations. The two sets of partners are aligned with heads in opposite directions, thus drawn on the same plane, as is generally the case in Australian rock art. Motif 15 {p. 627} (0.87 m long) with visible 'genitalia', is more carefully drawn than Motif 65 {p. 653} (0.36 m long). Both belong to the 'ghost-like' type previously described.

Depictions of stick figures

There are 45 stick figures.[4] These can be categorized into two main groups: the first concentration is in the centre of the Top Group and the second in the eastern part of the site. They are smaller than the 'ghost-like' figures since they only reach a mean length of 26 mm (Fig. 7.10; Table 7.6; Appendix: GTVT-23 {p. 631}, -28 {p. 632}, -31 {p. 636}, -34 {p. 636}, -38 {p. 639}, -41 {p. 641}, -43 {p. 642}, -46 {p. 644}, -47 {p. 644}, -70 {p. 656} to -73 {p. 656}, -84 {p. 661}, -91 {p. 663}, -93 {p. 664}, -98). Their very schematic shape is reduced to simple pecked lines. Motif 93 {p. 664} is fresh-looking, and was made by a different technique: it was hammered.

Fifty-two percent of stick figures are without depiction of gender, 35% are depicted as male, 7% as female, and 5% show parallel vertical lines, which may represent a pubic fringe.

However standardised, these small figures are full of life. Each of the six 'dancers' in a row (GTVT-73 {p. 656}) has a particular attitude. The one on the left has only one 'arm' because it is probably in profile and leads the others. Panel 70 {p. 656} shows an extraordinary group of five small motifs with depictions of two females, easily identifiable with their 'vulvae' and their laterally protruding 'breasts'. Between the 'legs' of one of them there is a small motif linked to the 'vulva'; it must depict a birthing scene with the newly born 'child' linked to the mother by the 'umbilical cord' (Fig. 7.10: GTVT-70 {p. 656}). To the right is another figure, in profile—because both 'arms' are depicted as being on the same side of the 'body'. The 'belly' is protruding. It can be interpreted as a new 'female' despite the 'breasts' being absent. The 'legs' are bent, and the subject seems to be in a squatting position. An arc motif underneath the 'bottom', without a linking cord, might again be the depiction of a newly born child.

Miscellaneous types

Included in the 'miscellaneous' category are figures of various forms, each depicted with some originality. GTVT-10 {p. 623} (Fig. 7.11) exhibits an exceptional position and technique. It occupies a stele-like slab standing out of a heap of small stones (below: 'Structures'). The figure seems to emerge from the mound. It was made using a light hammering; that is, by a technique different from that of all the surrounding carvings. It looks fresher and more recent than all the other motifs at this site. The top of the stele has been flaked intentionally to make stone artefacts. Such marks were observed on carved rocks in several different places in Gum Tree Valley, and in Skew Valley around the shell midden, and in other sites of the Burrup peninsula.

GTVT-21 {p. 630} (Fig. 7.12) is fully pecked. It probably depicts a human figure in profile. However, the identification is debatable. Its vertical position, the absence of 'ears' and 'tail', and the shape of the 'head' are human traits. The general attitude is identical to that of other figures in profile that are indisputably 'human' in appearance and that show, as here, the lower 'limbs' joining the 'body' above the rounded 'bottom', which hangs below. It has a line stuck in the back, probably representing a spear.

GTVT-33 {p. 637} (Fig. 7.10) is a 'female' figure, fully pecked, with two lateral 'breasts'. Motif 80 {p. 659} (Fig. 7.10) is another depiction of a female; its 'breasts' are disproportionate and the 'vulva' is represented by two diverging lines. GTVT-87 (Fig. 7.10), another female depiction, shows an astonishing contrast between a large 'body' and abnormally small 'head' and 'arms'; it has been superficially hammered and seems more recent than the deeply pecked figures.

Motif 90 {p. 663} (Figs 7.10, 7.13) is recognized as being among the most recent petroglyphs of this part of Gum Tree Valley because it shows a clear silhouette standing out on the dark background of the rock. The technique used is remarkable: a light regular pecking has produced a deep image with a flat, even base; the depression is seven mm deep. Another noticeable characteristic of this petroglyph is its tendency to geometrization: the 'legs' have an angular design, the 'body' is rectangular, the 'head' and the 'genitalia' (separated from the 'torso') are circular. The figure holds a 'boomerang' in its right 'hand' (however this hand is not linked to the object). It is the only obvious boomerang representation at the Top of Gum Tree Valley. With all its traits and the technique used, GTVT-90 {p. 663} is very similar to those of the group called the 'Climbing Men' in the northern part of Dampier.

GTVT-94 {p. 665}, with a small 'body' and two long linear 'legs', is unique. It consists of two small silhouettes in profile surrounded by a cloud of cup dots. The 'person' to the right was drawn by pecking elongated dots, while the dots of the left one are rounded. Their linear pecking technique, their general shape with a rounded 'head' and their deep patina make them closer to the 'ghosts' previously described.

'Human' figures in profile

Twelve 'human' figures (17.5% of the total) are in profile. There are in fact two types of profiles (Fig. 7.12):

1. Partial profile (four instances): both 'arms' are placed on the same side of the 'chest'. Sometimes only one 'arm' is depicted. A 'male' stick-figure (Motif 84 {p. 661}) has its 'genitalia' laterally placed—and the 'feet' seem to be also to the right of the 'legs' while the 'arms' are on both sides of the 'torso'. It could be another case of partial profile, the lower part of the individual only being in profile; and
2. Full profile (eight instances): the four 'limbs' are placed on the same side of the 'body' or one 'limb' only of a pair is depicted. These figurations in profile are either 'ghost-like' petroglyphs (four cases, including Motifs 16 {p. 628} and 96 {p. 666}) or stick-figures (eight cases, including GTVT-38 {p. 639}, -70 {p. 656}, -72 {p. 655}, -73 {p. 656}, -84 {p. 661}).

Depictions of ceremonial headdresses

Possible representations of ceremonial headdresses were recorded in different parts of Gum Tree Valley. However, they are rare at GTVT. Only three possible examples were identified (Fig. 7.14).

A tall 'human' figure (Fig. 7.14: 16) bears on the top of the 'head' three diverging lines but, because the entire silhouette shows many lateral lines, it is difficult to distinguish one

Table 7.4. GTVT. Distributions of various motif categories on 105 numbered surfaces (Table 4 continues next page).

panel	'humans'		'animals'						'prints'		implements			geometrics										indet.	totals
GTVT-								other					other												
1	1																							2	3
2	1																								1
3			1																					1	2
4					1																				1
5																				1					1
6	1			1																	1				3
7	1																								1
8								1																1	2
9			1																						1
10	1																								1
11																								1	1
12									2																2
12A																		1						2	3
13									2																2
14				1																2	1		1	1	6
14A									4																4
15	2*																								0
16	1													8									31		40
17	1																						6		7
18			1														1								2
19																	1								1
20			1					1																	2
21	1																								1
22																								1	1
23	1																								1
24																								1	1
25										1										1					2
26			1																						1
27	1																								1
28	1		1																						2
29	1																								1
30																								1	1
31	1		2																						3
32							2															2		2	6
33	1																						2	1	4
34	2																1			1				3		7
35																				3			1			4
36																								1	1
37																								15	15
38	11																					1		12		24
38A	3					2																				5
39			1																							1
40						1																				1
41	1																									1
42																						1		1	2
43	5																					2		55		62
44																								2	2
45						1																1		3		5
46	1					1																		4		6
47	1																									1
48																	1				1			4	1	7
49										1																1
50	2																					1		4	1	8
51																									1	1
52		1																				3		24		28
53																				1						1
54									1																	1
55		1																						1		2
56		1																								1
57										2										1						3
58		1																								1
59										1																1
60										1																1
61																				1				1		2
62				1																						1
63														7										1		8

... / table continues next page

Table 7.4 (continued). GTVT. Distributions of various motif categories on 105 numbered surfaces.

panel	'humans'		'animals'						'prints'		implements			geometrics												indet.	totals
GTVT-								other					other															
64	1								5																1		7
65	2*																										0
66			1																								1
67																										1	1
68		1																									1
69																									5		5
70	5																										5
71	1																6										7
72	1																										1
73	6																										6
74					1																				3	1	5
75																				1	1						2
76																				2							2
77																									1	1	2
78								1																			1
79	1																										1
80	1																										1
81																					1						1
82																		1								1	2
83																					1						1
84	1																										1
85																							1				1
86	1																										1
87	1																										1
88	1																						1				2
89														1													1
90	1										1																2
91	1																								2		3
92																										1	1
93	1																										1
94	1																										1
95														1											1		2
96	2																								22		24
97														1			1										2
98	2																										2
99																										1	1
100																										1	1
101																										1	1
102																										1	1
	68	5	10	3	2	5	2	3	14	6	1	0	0	18	0	0	5	0	6	6	0	11	17	2	189	43	416
	73		25						20		1			254												43	416

	'humans'		'animals'						'prints'		implements			geometrics											
								other					other													
	'human' figure	'human foot or hand print'	'kangaroo'	'bird'	'snake'	'turtle'	'fish'		'kangaroo foot print'	'bird foot print'	'boomerang'	'spear'		circular form	concentric circles	radii in circle	arc-like form	pair of arcs	multiple, nested arcs	bi-lobe form	triangular form	oval form	linear form	scratched surface	punctations (dots)

from the other. However, two of the three in the 'head' have a different, curved base; moreover, they are grouped together to constitute a sort of trident. The long 'ghost-like' figure (Motif 29 {p. 634}) possesses on the rounded top of its 'head' a small circle (70 mm in diameter) formed by a dozen pecked dots. A stick-figure (Motif 46 {p. 644}) has four dots symmetrically placed that may represent paraphernalia laterally stretched on both sides of the 'head'. The interpretation of the details of these three motifs remains, however, hypothetical.

Depictions of hands and feet

Two depictions of hands[5] and three of feet were recorded at the GTVT Group. They are carved by a linear pecking technique with big separate dots and are deeply patinated. One (GTVT-68 {p. 654}) was obtained by an unusual technique: deep scratching. The 'feet' images are slightly shorter than that of an adult foot as their lengths measure respectively 170 and 230 mm. They have an elongated form and one has five, and the other six, 'toes'.

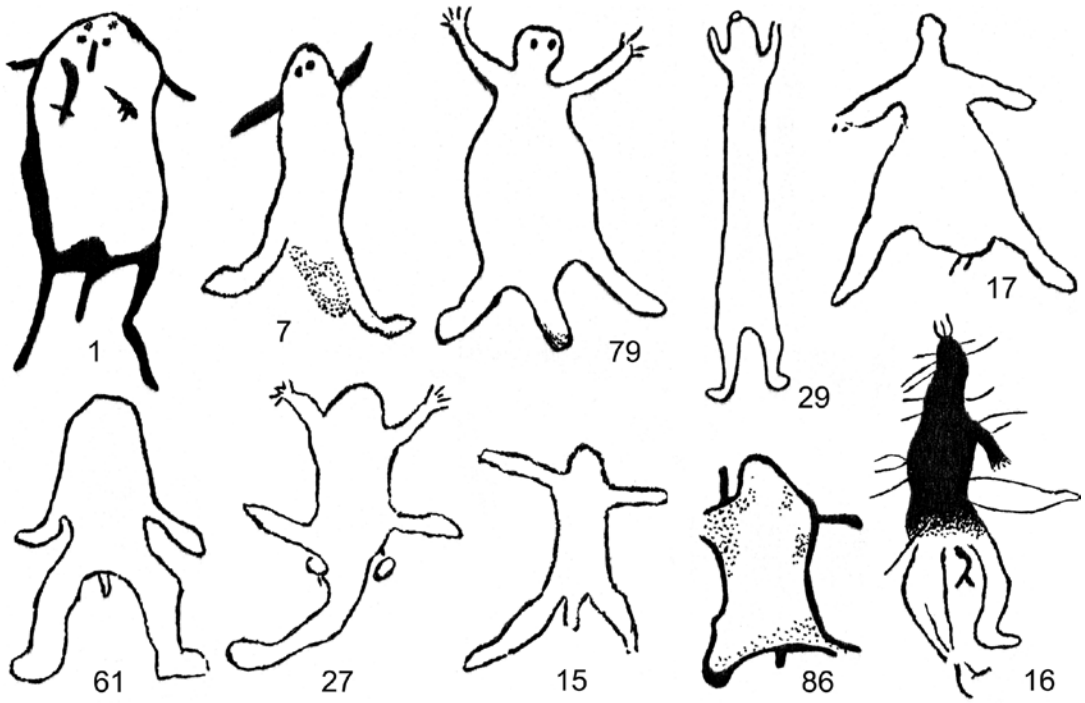


Figure 7.8. GTVT. Examples of 'ghost-like' figures. Various sizes.

Figure 7.9. GTVT. Detail of head of 'ghost-like' figure. Scale 100 mm.

Table 7.5. GTVT. Dimensions of Ghost-like figures.

mean length	range of lengths	tall examples	range of lengths
750 mm	260–2350 mm	1, 7, 16, 17, 27, 29, 64, 79, 88	880–2150 mm

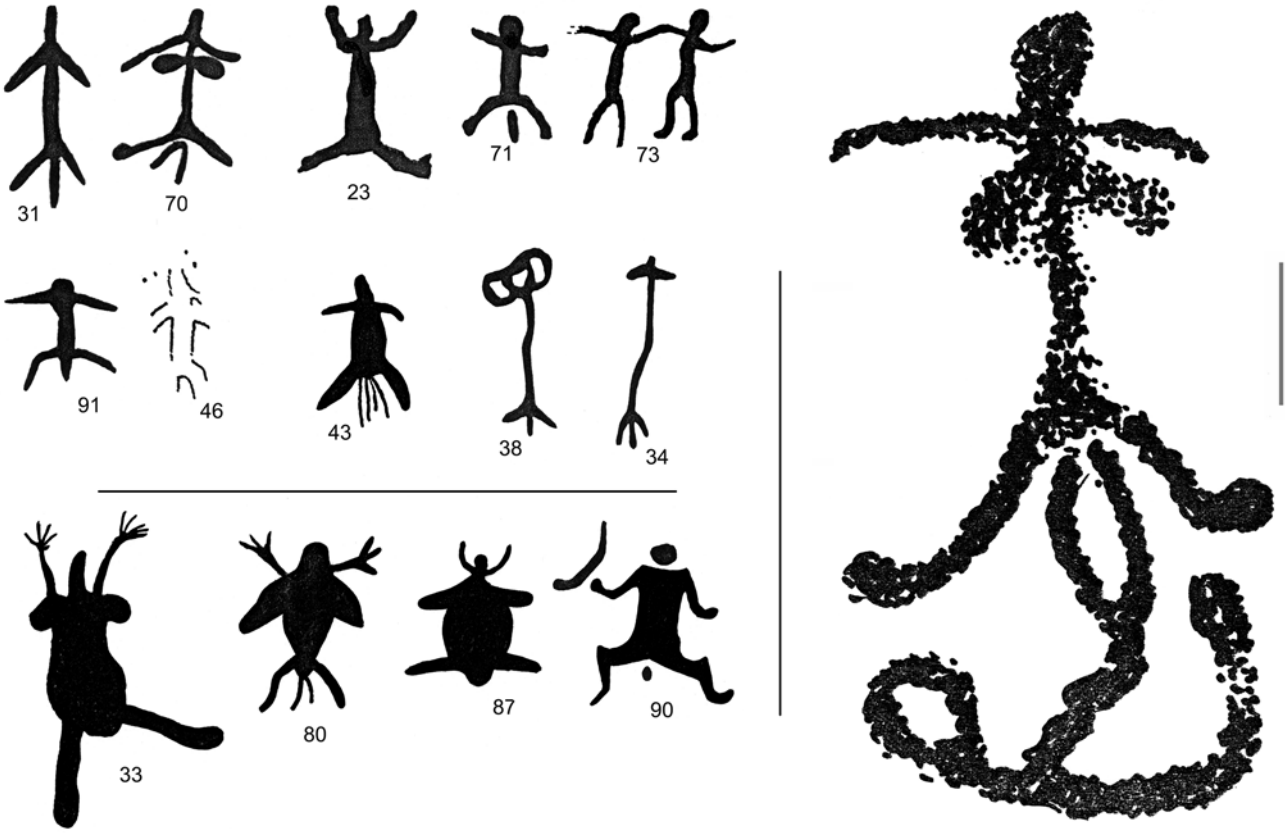


Figure 7.10. GTVT. *Upper:* examples of sick figures. *Lower:* other categories. Various sizes. *Right:* GTVT-70 detail, stick figure with depiction of newly born child. Scale 50 mm.

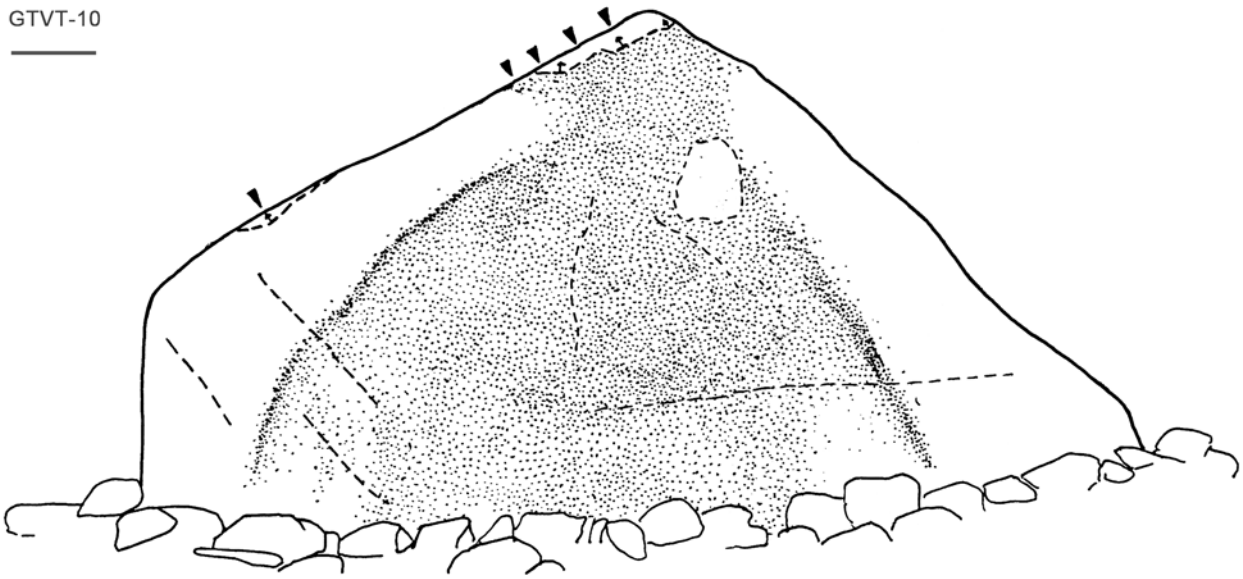


Figure 7.11. GTVT. GTVT-10. Motif on stele-like block. Top of block has been struck to obtain flakes to make artefacts. Scale 100 mm.

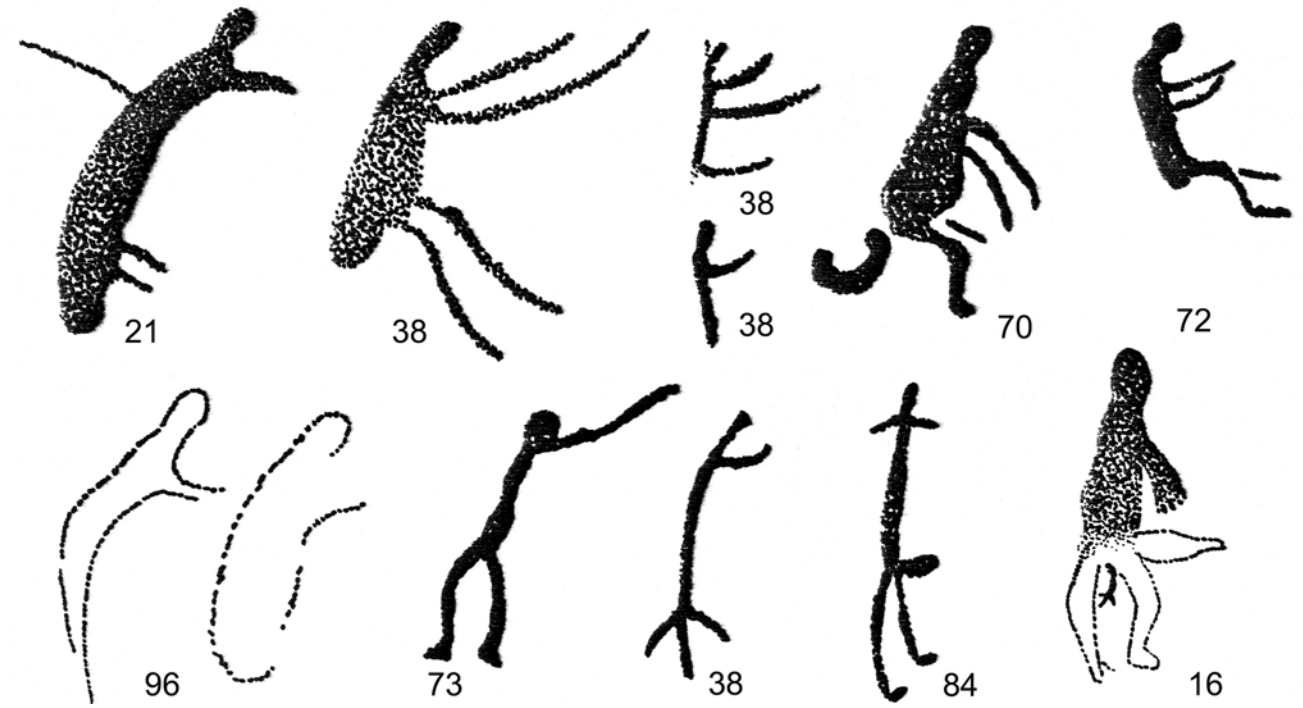


Figure 7.12. GTVT-10. 'Human' figures in profile (orientations and scales standardised); Motifs 21, 38, 70, 72, 96: full profile. Motifs 73, 38, 84, 16: partial profile.

Figure 7.13. GTVT-90: figure holding 'boomerang'. Note light pecking and colour contrast. Scale 100 mm.

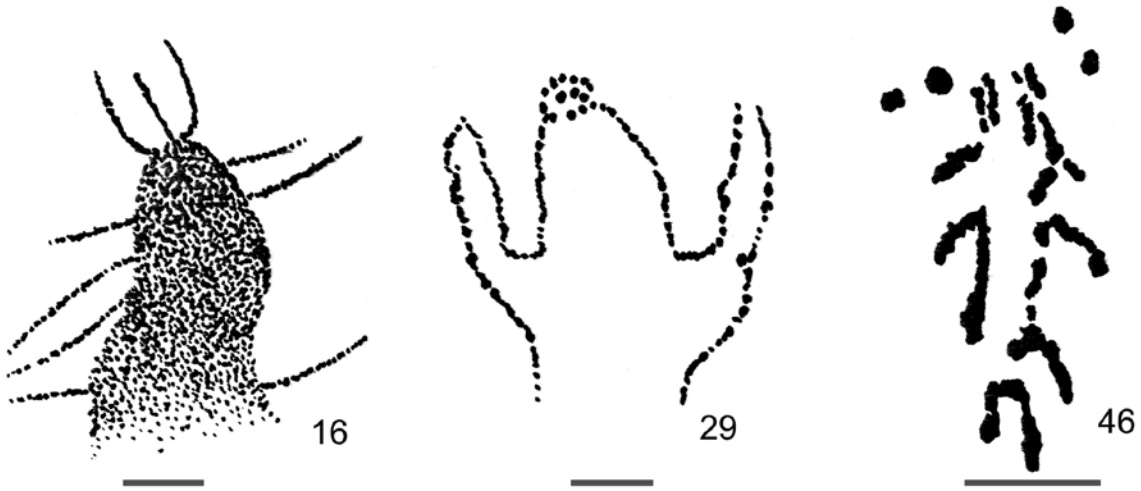


Figure 7.14. GTVT. Possible examples of 'headdresses'. Scale 100 mm.

The depictions of 'hands' differ from the 'feet' by their circular or short triangular shape GTVT-55 {p. 648} is probably a representation of a hand since the 'thumb' is individualized.

But the identification of GTVT-52 {p. 647} (160 × 150 mm) is more problematic. It could depict an animal track, one representing, for example, the front paw of a kangaroo, because the front 'foot' of this animal resembles closely a human hand, the thumb of which would not be separated from the other fingers. However, that its size is too big for a kangaroo, the technique used, and its close association with the neighbouring hand and feet drawings, persuade us to interpret it as a human hand.

Distribution of categories of human motifs

The distribution across the Top of Gum Tree Valley of the various categories of 'human' motifs is shown in Fig. 7.15.

Table 7.6. GTVT. Dimensions of stick figures.

mean length	range of lengths	median lengths
260 mm	260–2350 mm	c. 200 mm

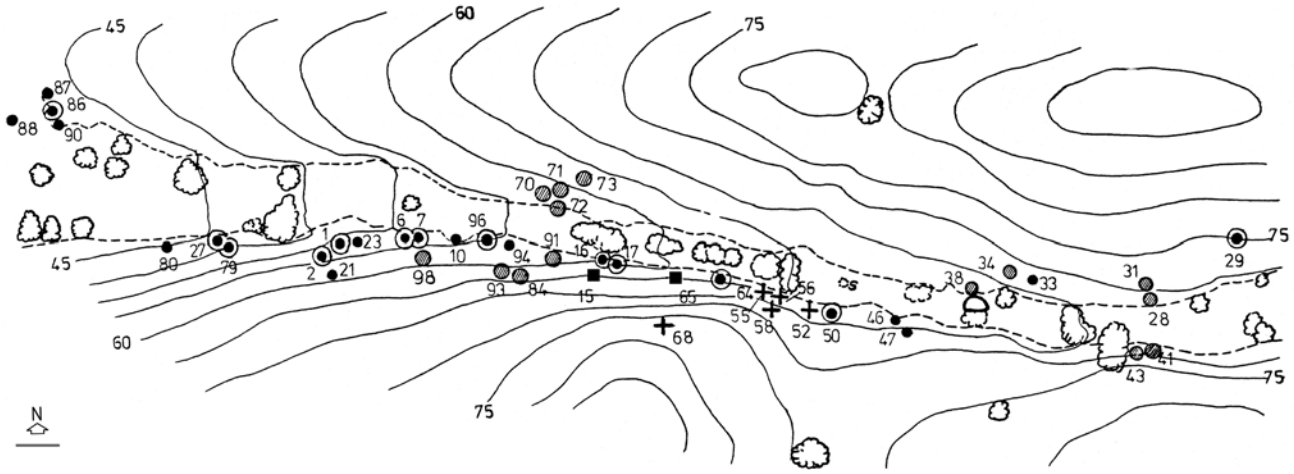


Figure 7.15. GTVT. Distributions of various categories of 'human' figures. Scale 10 m. Key: ⦿ = 'ghost-like' figure; ● [hatched circle] = stick figure; ■ = 'coitus'; ● = other type; + = 'hand' or 'foot'.

Depictions of animals

Twenty-five depictions of animals were recorded. Three of them were too crudely carved and badly preserved for identification to be possible. The others appear to depict kangaroo, birds, snakes, turtles and fish.

Depictions of macropods

Ten 'kangaroo' were recorded among the group of carvings of the upper part of Gum Tree Valley (Fig. 7.16). Most of them are large motifs, 900–1000 mm in length. Three examples are of small size (210, 360 and 390 mm). The technique and the morphology allow us to identify three categories:

1 figures with a linear outline pecked with big separated dots (GTVT-9 {p. 622}, -18 {p. 629}, -26 {p. 632}). Completely in profile, they have one 'leg' to represent the pair. 'Limbs', 'ears', 'tails' and 'genitalia' are simple off-shoots of the outline. The large size, the technique, the style and the patina make them similar to the 'ghost-like' human figures;

2 'Kangaroo' with linear 'limbs' and 'ears', attached to an oval-shaped 'body', often a closed shape in itself (Fig. 7.16: 3, 28, 31, 39, 66). They are either fully pecked (3), or a linear design with local pecking that forms the 'head' (28, 31, 66). GTVT-31 {p. 636} is a depiction of a small kangaroo (390 mm) superimposed onto the 'belly' of a larger example (1008 mm long), the outline of which is partially filled in with dots. It is possible that we are dealing with the depiction of a female holding a 'joey' in her 'pouch'. The specific identification of these varied specimens, which are too schematised, is impossible. However, Motif 39 {p. 639}, because of the length of the 'head', the curve of the 'back' and its small size, suggests a rat-kangaroo, which is quite different from its large relatives. But it is difficult to be sure, because such a unique difference could be fortuitous and simply linked to the personal style or lack of skill of the carver; and

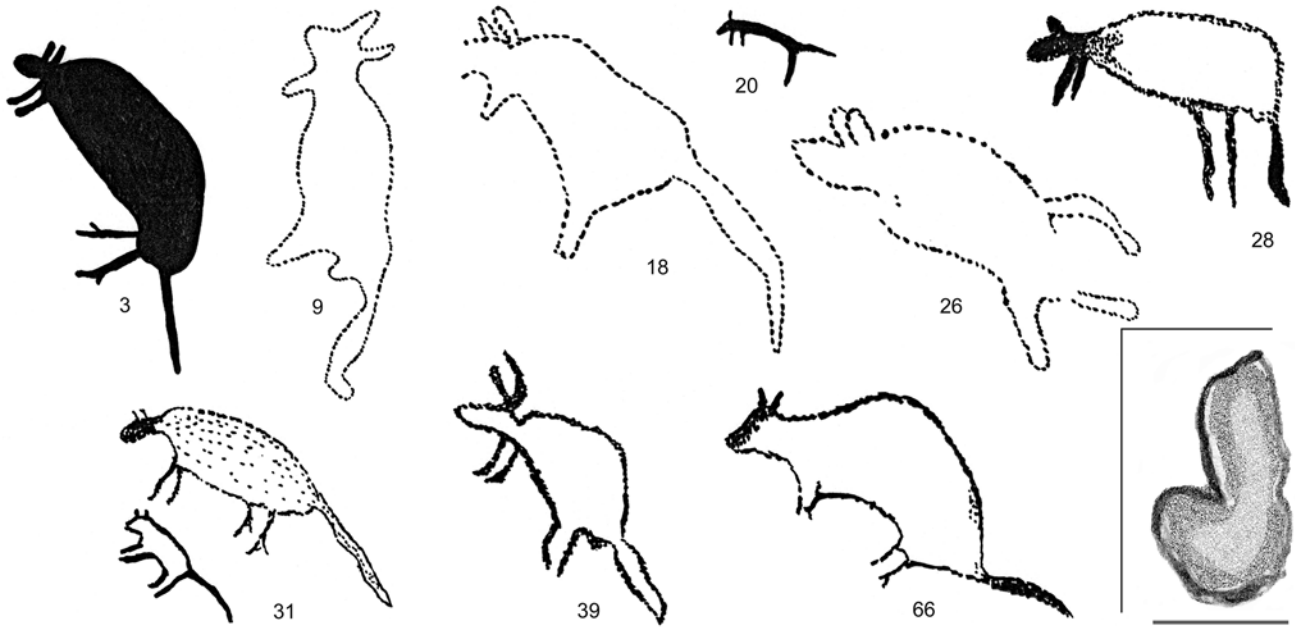


Figure 7.16. GTVT. Depictions of 'kangaroo'. Various sizes; GTVT-54: 'Kangaroo track'; light colour contrast at base. Scale 50 mm.

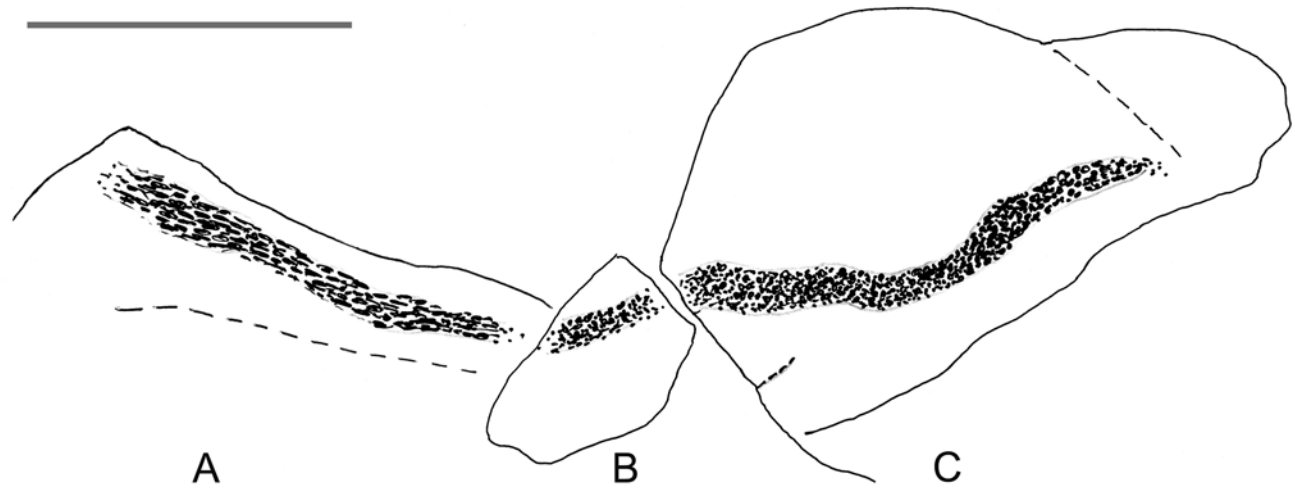


Figure 7.17. GTVT-4. Depiction of a 'snake', 3 m long, pecked on three blocks (A, B, C). Scale: 1 m.

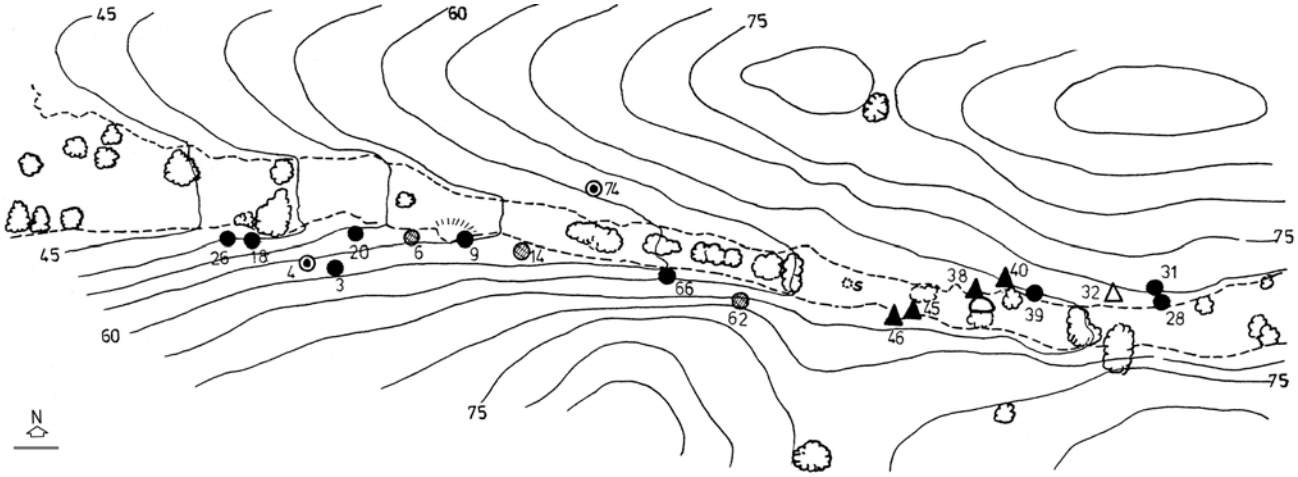


Figure 7.18. GTVT. Distribution of 'animal' figures. Scale: 10 m. Key: ● = 'kangaroo'; ▲ = 'turtle'; ⦿ = 'snake'; Δ = 'fish'; ● [hatched circle] = 'bird'.

3 small linear 'kangaroo' in the stick-figure style. Panel 20 {p. 630} shows a small 'animal' (210 mm long), very schematic; its attitude, length of 'tail', length of 'hind limbs' and small 'forelimbs' placed under the 'head', combine to allow us to identify a depiction of a kangaroo in the stick-figure style. It is a unique example.

Depictions of birds

Three birds are depicted. In all, a general shape, with a long neck and a rounded tail, suggests the Emu; the 'head' is either missing or without detail. Two were drawn using linear pecking with big separated dots (GTVT-6 {p. 619} and -62 {p. 651}), while the third (GTVT-14 {p. 626}) is fully pecked. It is notable that Motif 6 {p. 619}, which is large (700 mm), shows the same characteristics as the 'ghost-like' figures and as some large 'kangaroo'; its 'legs' are big off-shoots of the outline. Thus, particular stylistic constants distinguish the 'bird' carvings of the western part of the top of Gum Tree Valley.

Depictions of snakes

Only two serpentine forms were identified (GTVT-4 {p. 618} and -74 {p. 657}. The former is a pecked ribbon that stretches out over 3 m in length, and across three different slabs (Fig. 7.17). A part of the pecking runs over the edge of the slabs, which shows that the motif was originally carved on three different rocks, not on a single slab that later broke up. This giant motif probably depicts a python. Its right part has been re-carved locally; on Block A, the pecked dots are elongated, whereas on Block C they are rounded. The difference in the patination reveals this partial renovation. The second snake motif (maximum length 700 mm) has a triangular 'head' and a fat 'body' partly re-coiled on itself. This is probably a depiction of a Death Adder.[6]

Depictions of turtles

Five carvings of 'turtles' were recorded near the saddle at the eastern end of Gum Tree Valley, on the central boulder or very near it (GTVT-38A {p. 638}, -40 {p. 640}, -45 {p. 643}). They have elongated, oval-shaped 'bodies' in the traditional style of depiction of turtles. Their maximum length varies from 250–500 mm. All are fully pecked and show slight colour contrast with the surrounding rock, which indicates that probably they are not as old as the deeply patinated carvings near them. Motif 40 {p. 640} seems to present seven 'fins'; are we dealing with a renewal of the figure or with a representation of coitus, two animals being superposed?

Depictions of fishes

Two carvings of 'fish' are grouped together on Panel 32 {p. 637}. The first depicts a fish (550 mm long) with an elongated oval shape made by linear pecking; a simple narrowing at the end of the 'body' indicates the 'tail fin', and the 'eye' is a simple small hollow. The second probably represents a stingray (total length 870 mm) with an almond-shaped 'body' decorated by seven dots. All the representations of sea creatures are clustered near the saddle; that is, at the eastern end of the valley (Fig. 7.18).

Depictions of animal prints

Fourteen carved depictions of kangaroo tracks and six of bird (possibly Emu) tracks were recorded.

Depictions of macropod prints

Generally, several 'kangaroo prints' were found grouped together. However, GTVT-54 (Fig. 7.16) is a single isolated print. GTVT-12 {p. 624} and -13 {p. 625} (Fig. 7.19) depict two different forms. Panel 14A {p. 626} shows four items; Panel 64 {p. 651} has five. All these petroglyphs are on horizontal surfaces or on slightly sloping ones. Two different versions can be distinguished:

1 depictions that can be recognized as 'realistic' in that their size (mean length = 95 mm) corresponds to that of realistic Euro or rock-wallaby foot-prints. They are fully pecked; and
2 giant tracks (mean length = 240 mm), clearly bigger than the foot-prints of the present-day kangaroo. They were made using linear pecking with large separated dots.

All the depictions of kangaroo prints are oriented south-to-north; that is, across the valley. They symbolize animals crossing the valley instead of following the thalweg (Fig. 7.20). On Panel 14A {p. 626}, which is located right in the bottom of the valley, they are orientated towards the north, while all those on the southern side are oriented in the opposite direction to the slope; that is, towards the south, towards the summits commanding the valley.

All these motifs depict the back feet of a kangaroo. They represent the quick run of a bouncing animal. On Panel 64 {p. 651}, an additional line between the prints of the 'back feet' represents the mark of the tail (which sometimes strikes the ground during the bounce).

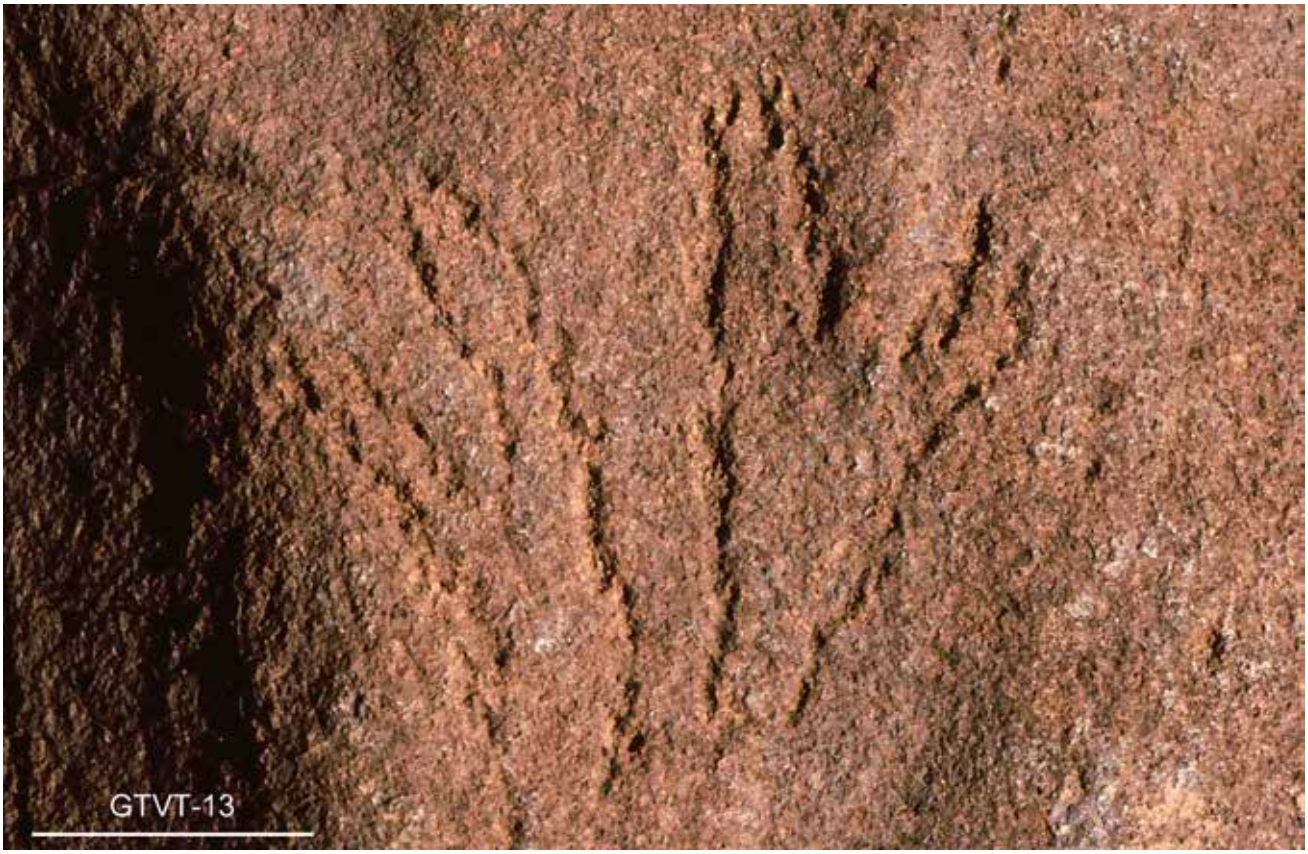


Figure 7.19. GTVT-13. Depiction of giant ‘kangaroo tracks’; linear pecking, deeply patinated. Scale 100 mm.

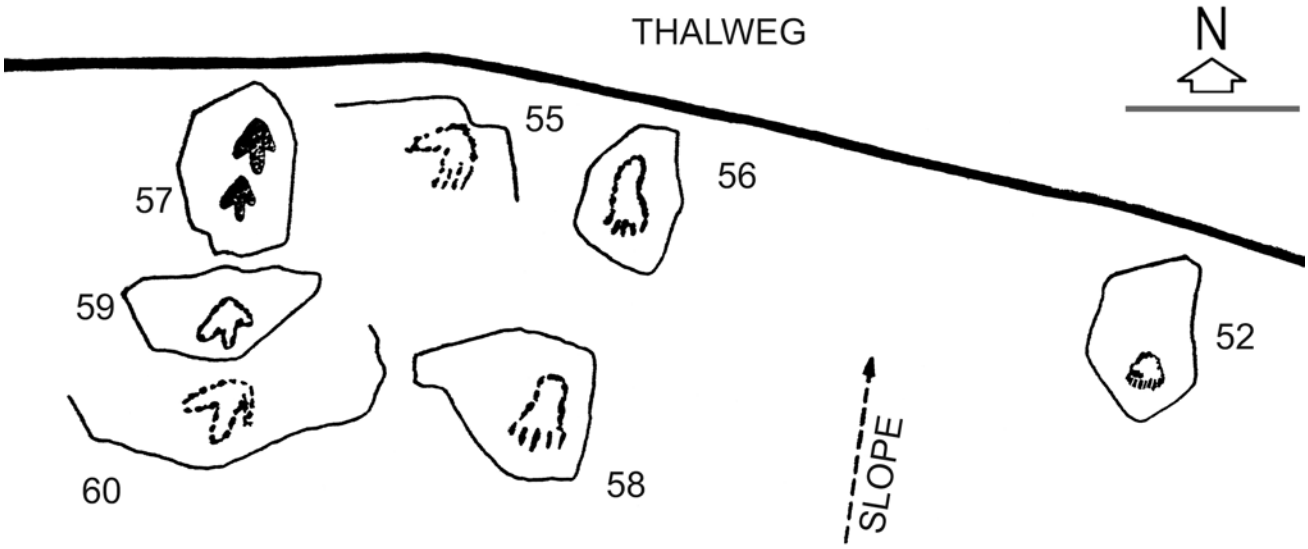


Figure 7.20. GTVT central area. ‘Tracks’ across the southern slope. Scale 2 m. Motifs 57, 59, 60 depict Emu prints. Motifs 52, 55, 56, 58 depict human prints.

Depictions of bird prints

The six large (mean length = 195 mm) trident-shaped motifs depict Emu footprints. The technique used was linear pecking with big separated dots.

Unlike the other carvings of ‘footprints’, two motifs were placed on vertical walls. Four are on horizontal surfaces or on rocks slightly sloping towards the valley. They are orientated towards the top of the slope, perpendicular to the axis of the valley. Fig. 7.21 shows the distribution of ‘animal tracks’ across the central part of the GTVT group.

Geometric patterns

Dots or punctations

A total of 29 ‘dots’ (‘punctations’ or ‘points’) was recorded at Gum Tree Valley Top. Dots are small cup-shaped depressions in the rock surface, usually round, about 20–30 mm in depth, which are achieved by repeated pecking. There is usually just one example or sometimes two, three or four on the same rock surface. These multiple instances do not appear to comprise a proper group, as they are scattered over the whole surface. They are associated with various motifs: human ‘ghost-figures’, stick-figures, depictions of snakes, fishes and tortoises, and oval shapes (Fig. 7.22).

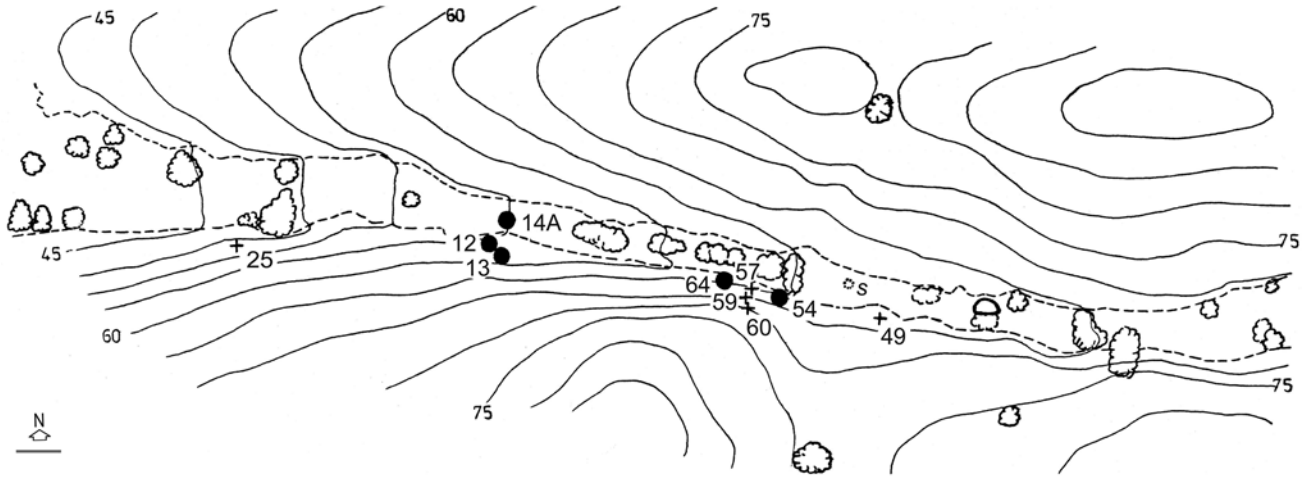


Figure 7.21. GTVT: Distribution of 'animal tracks'. Scale 10 m. Key: ● = 'kangaroo track'; + = 'bird track'; *s* = soak.

There are 14 single (isolated) dots. The grouped points are more numerous. A total of 160 in nine groups was recorded (Table 7.7). They were of the same type as the previously discussed cupules, except for GTVT-69 {p. 655}, which showed, on a small slab, an isolated group of five large dots varying in diameter from 30–60 mm. These are the only dots that are on their own, isolated, at Gum Tree Valley's summit. All the rest are linked with various motifs, 'ghost-figures', stick-figures, complex linear motifs and several indeterminate motifs.

Punctations are found frequently clustered in groups of three, placed in a triangle, sometimes four in a line. But the important groups, for example, the 24 dots of GTVT-52 {p. 647} and the 54 points of GTVT-3 {p. 617}, are 'nebulous' in apparently random arrays. Therefore, the dots of Gum Tree Valley's summit are generally arranged in an anarchic fashion. Only in exceptional instances, do they form a separate motif on a rock surface. Usually they are connected to various figures utterly different from one another. Identification of the various geometric types is provided in Table 7.7.

Figure 7.22. GTVT. Examples of groups of dots. Scale 100 mm. On Motif 96 {p. 666}, a few dots appear to follow the 'backs' of 'human' figures in profile.

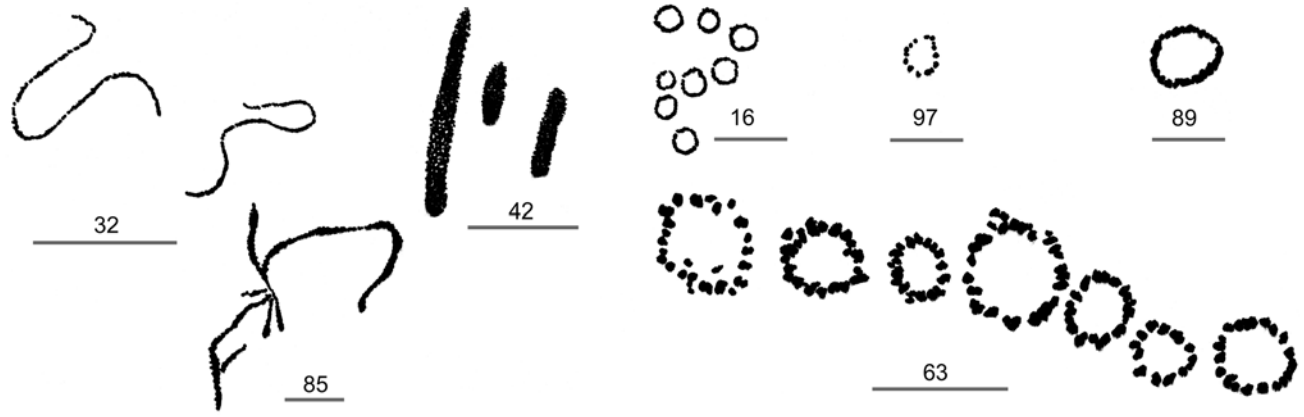


Figure 7.23. GTVT. Examples of linear (left) and circular forms (right). Scale 100 mm.

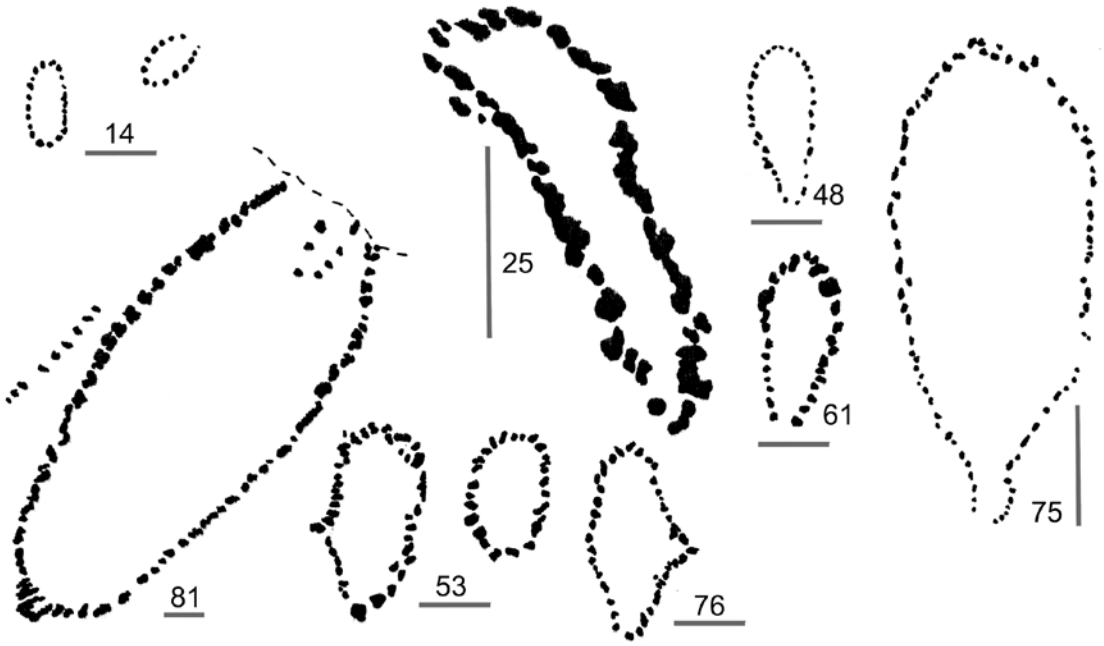


Figure 7.24. GTVT. Examples of oval motifs. Scale 100 mm.

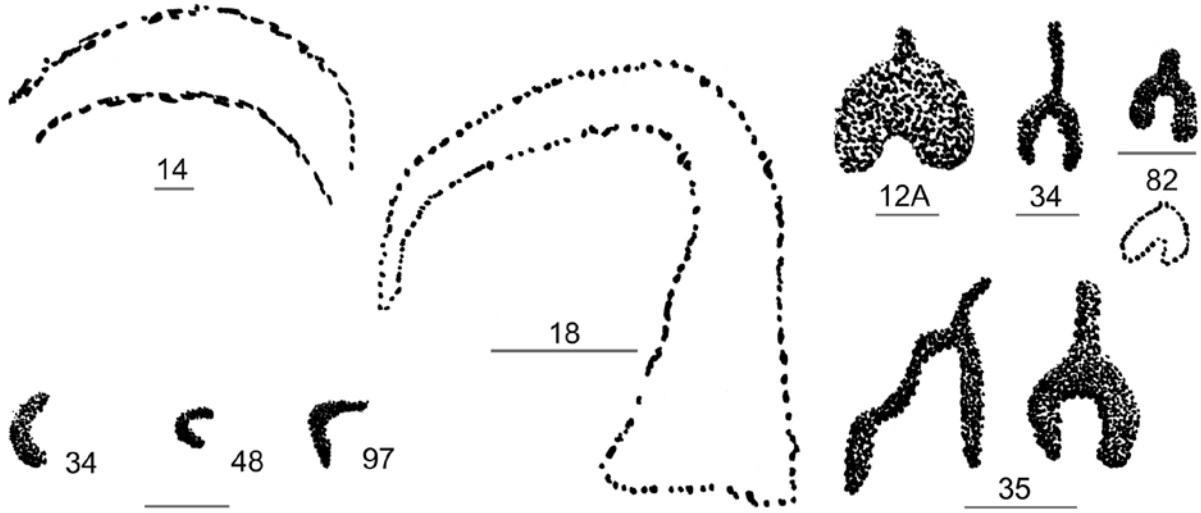


Figure 7.25. GTVT. Examples of arc-like forms (14, 18, 34, 48, 97), and bi-lobed forms (at right). Scale 100 mm.

Linear forms

Under this rubric, I have categorized a group of about 20 linear markings. They were made by the same pecking technique as the other figures. They present complex shapes due to the undulating character of the lines. They vary greatly in size, ranging from 50–300 mm in length.

Some of these motifs could be the remains of figures that partly have disappeared, but others are complete as might have been intended. Occasionally, one might ask whether the threadlike petroglyphs were intended as depictions of snakes or worms, but I prefer to classify them in the category of 'linear motifs', because the snake carvings of GTVT are much more explicit. Indeed, they are drawn with a double line or with a thicker pecked band. Undulating or straight, the linear motifs are almost always linked with other figures of various types, representations of human, birds or fish. GTVT-85 {p. 662} is the only isolated linear motif.

Circular forms

There are seventeen small circles of a mere 40–90 mm in diameter (Fig. 7.23). They were formed by a linear pecking of separated dots. They are clustered into two groups—one of eight, another of seven circles, and two separate examples. GTVT-89 {p. 662} is an example of an isolated motif. The group of circles on Panel 16 {p. 628} create an S-shape that accompanies the largest human figure on Gum Tree Valley's summit. GTVT-97 {p. 665} shares the panel with an arc-shaped motif (Fig. 7.23).

The group of seven circles, aligned as shown in GTVT-63 {p. 652} (Fig. 7.23; Appendix), originally was probably an isolated petroglyph, since it is deeply patinated and is situated on the same rock near three cupules that appear to be more recent and were probably added later.

Oval forms

In total, 13 ovoid motifs were distinguished. They are all carved in linear pecking with discrete dots (Fig. 7.24). They all differ in shape and size. Their range of variation is illustrated by their widths representing 32–50% of their lengths; some examples are extremely elongated whereas others are almost round. Two have a lateral extension (Fig. 7.24: 53 and 76), another two have an appendage at one end (Fig. 7.24: 75, GTVT-87). These last two ovals are large (400 and 870 mm long). Since the other ovals measure between only 100 and 300 mm in length, it is possible that these large motifs have a different significance to that of the small ovals.

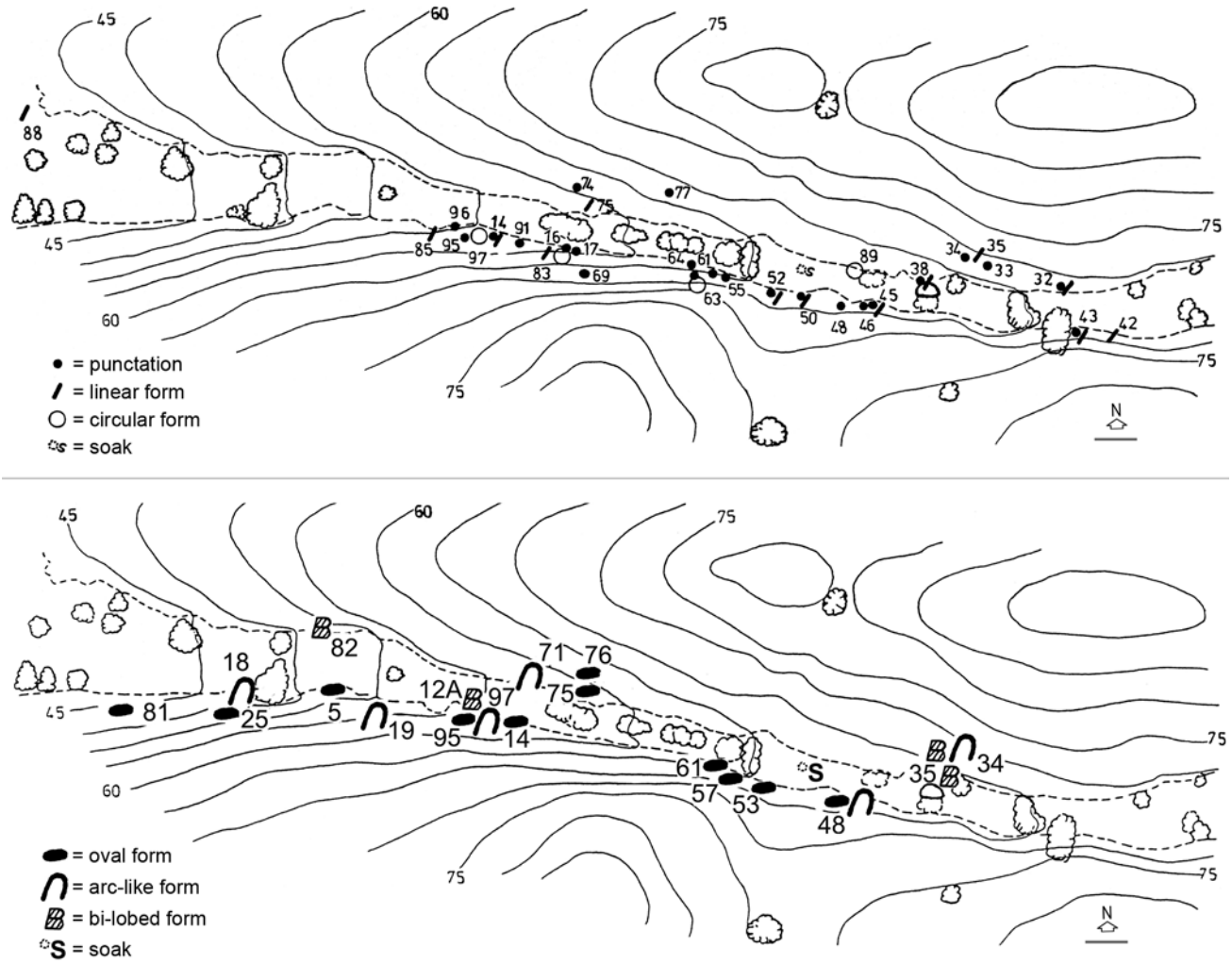


Figure 7.26. GTVT. Distributions of geometric motifs. Scales 10 m.

Three oval motifs are isolated (GTVT-5, -53 {p. 647} and -81 {p. 660}). Of those remaining, three are associated with dots, two with 'bird tracks', and one example (GTVT-76 {p. 658}) with another oval. This last pair of ovals is placed adjacent to linear or indeterminate petroglyphs. There is a single association of an oval with a depiction of an animal figure, a 'bird' (GTVT-14 {p. 626}), and none with 'humans'.

Arc-like forms

There are 11 motifs in an arc shape (Fig. 7.25: left). There is one single and several parallel arcs. The technique is again linear pecking with separate dots or with juxtaposed dots. These carvings are either small (about 120 mm long), where the whole surface is pecked (Fig. 7.25: 34, 48, 97), or large linear curves (350–790 mm). The smaller arc motifs are associated with several figures, other geometric patterns or human stick-figures. One of the large curves is isolated (Fig. 7.25: 19), and the other (18) is superimposed on a depiction of a kangaroo.

GTVT-71 {p. 656} shows a contrivance extraordinary in this part of Gum Tree Valley. It consists of two groups of three similar arcs, each with a chord (that is, the distance between the ends of an arc) of 200–300 mm, framing a 'human' stick-figure. The arcs and the 'human' seem to create a single image.

Bi-lobate forms

Six petroglyphs (ranging in length from 90–270 mm) can be classified as bi-lobate forms (Fig. 7.25: right). They can be linear (GTVT-34 {p. 636} and -35 {p. 638}) or have enlarged lobes (GTVT-12A {p. 624} and -82 {p. 660}), or they might be entirely pecked or drawn with separate dots.

Distribution of GTVT geometric forms

The distribution maps of the geometric motifs (Fig. 7.26) show that the geometric forms have a wide distribution across the Top Group from west to east. This wide distribution in space appears to be associated with a wide distribution in time also, since the various geometric motifs extend into the areas with deeply patinated petroglyphs as well as those of less patination as we shall see below.

Table 7.7. GTVT. Identification of various geometric motifs.

motif type	motif numbers (GTVT-)
single dots	14, 32, 33, 45, 46, 50, 55, 61, 63, 64, 74, 77, 91, 95
grouped dots	16, 17, 34, 38, 43, 48, 52, 69, 96
linear forms	6, 14, 32, 35, 38, 42, 43, 45, 50, 52, 75, 83, 85, 88
circular forms	16, 23, 89, 97
oval forms	5, 14, 48, 53, 57, 61, 74, 75, 76, 81, 95
arc-like forms	19, 18, 34, 48, 97
bi-lobed forms	12A, 34, 35, 82

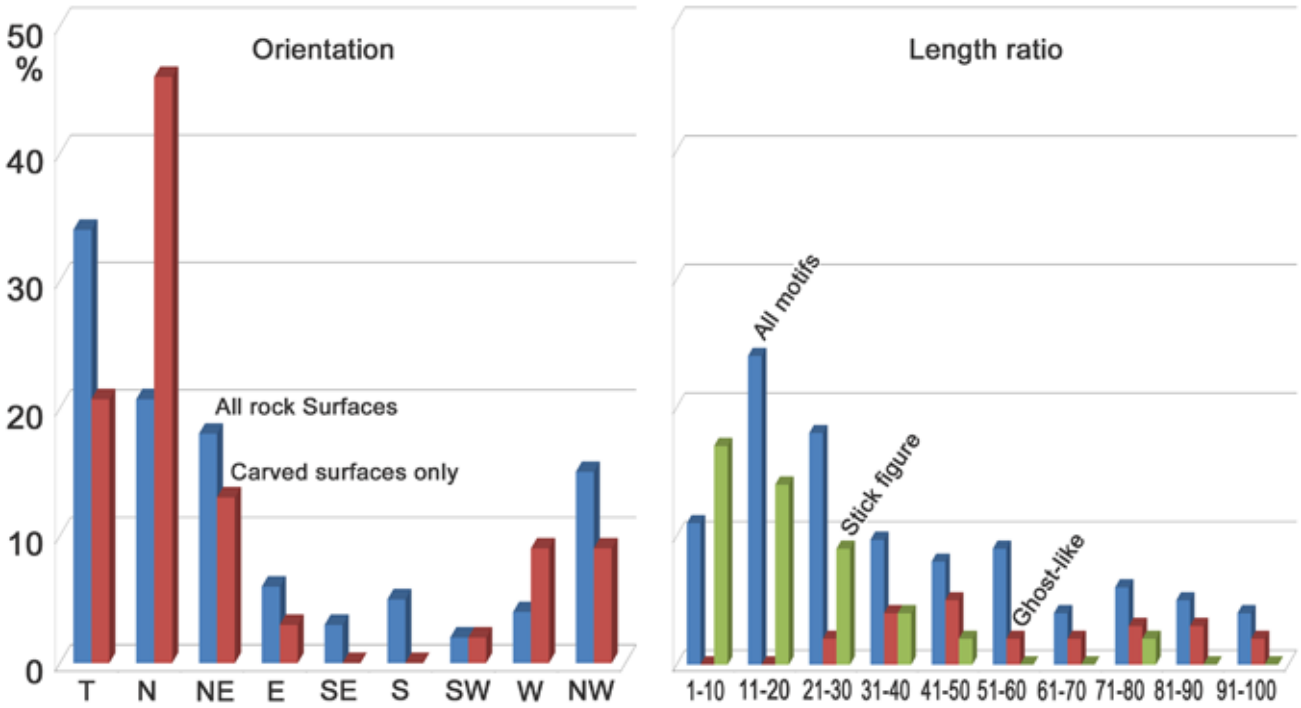


Figure 7.27. GTVT. Left: Histogram of orientations of the rock surfaces. Vertical axis: percentages of motifs. Horizontal axis: T = top, N, etc. = compass directions. *Right*: histogram of length ratios of motifs. Vertical axis: percentages of motifs; horizontal axis: ratio of motif categories to support (length of figure / length of support × 100).

The Top Group rock supports

As is usual in Gum Tree Valley, the carvings of the Top Group can be found on various flat surfaces of slabs of gabbro that are often of large dimensions. Although of different shapes, they are usually geometric, of a dark brown colour and a coarse grain. I set out to ascertain whether the petroglyphs fill the available surfaces without any special significance, or whether a different relationship exists between the figures and their support.

We will see later that the carvers have favoured the surfaces facing towards the north. Here we should enquire whether the dimension was a criterion of choice and if the shape of the surface that was to be carved influenced the morphology of the petroglyph.

Sizes and forms of the support panels

Dimensions

In a test area, all rock surfaces, whether carved or not, were measured and classified into three size categories (Table 7.8). Of the uncarved surfaces (more than 100), the great majority were 'small'. The same system of classification was carried out for all the 100 carved slabs. Small carved slabs only represented one third of the total carved slabs (Table 7.8). Therefore, a distinct difference exists between the sample taken of 'natural' slabs and of carved slabs. This difference suggests that a choice was being made of the available surfaces; indeed, there was a clear preference (67%) for the medium and large slabs. Since the mean of the maximum dimension of the motifs is only 490 mm, the images often do not fill the whole of the available surface. If the relation between the size of the motifs and that of the support is calculated, we see that, on the whole, a large proportion of the motifs occupy only 20–30% of the slab lengths, and that a very small proportion are spread over the entire surface (using 70–90% of the length of the support).

Table 7.8. GTVT. Analysis of block sizes of carved and uncarved surfaces.

size category	uncarved blocks	carved blocks
(surface area)	proportion (%)	proportion (%)
small (<1 m^2)	70	33
medium (1–2 m^2)	26	42
large (>2 m^2)	4	25

These observations are influenced by a study of the type of motifs. The 'ghost-like' figures tend to take up a large proportion of the space available. Their lengths usually cover from 40–50% of the block and sometimes as much as 80%, whereas the stick-figures generally use only 10–20% of the support length. The few 'animal' figures usually occupy 30–40% of the maximum dimension of the rock. Finally, the geometric motifs, which are comparatively small, only use a small proportion of the available surface area.

Therefore, even though the carvers chose slabs of large dimensions, their depictions usually did not take up the whole of the surface available. The effect is that the motifs tend to appear to drift indiscriminately in space; the small stone slabs were not sought out for the small motifs. The only example of total framing is in the case of the 'human-ghost' petroglyph (GTVT-1 {p. 617}), which extends over rocks of the most impressive size. The largest figures at Gum Tree Valley Top are indeed the depictions of humans.

Forms

More than 80% of the figures have no relevance to the shape of the rock support. Despite the sharpness of the natural boundaries, the surfaces provided by each block in fact influence neither the dimension nor the morphology of the motifs. Some of them even appear unrestrained by these boundaries. They overflow and spill out onto neighbouring surfaces. For example, with GTVT-1 {p. 617}, the 'human-ghost' motif's extremely short 'arms', reduced to mere stumps

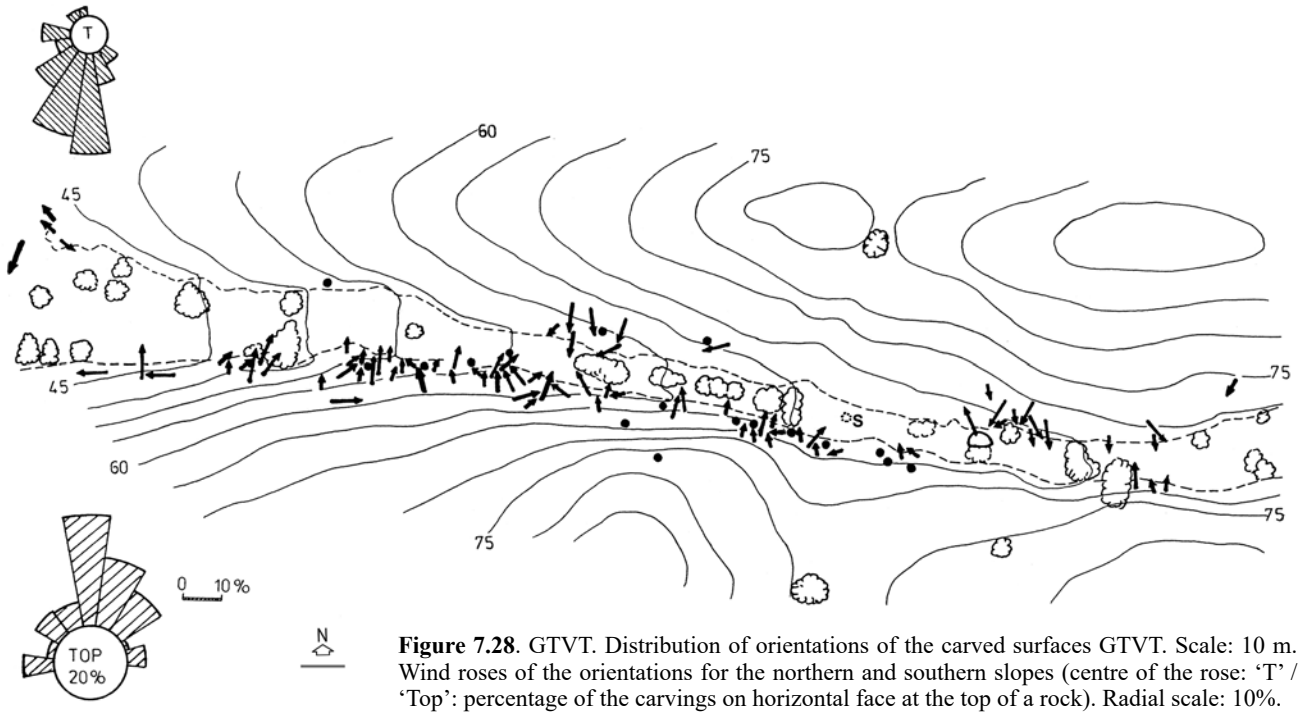


Figure 7.28. GTVT. Distribution of orientations of the carved surfaces GTVT. Scale: 10 m. Wind roses of the orientations for the northern and southern slopes (centre of the rose: 'T' / 'Top': percentage of the carvings on horizontal face at the top of a rock). Radial scale: 10%.

and extending perpendicular to the 'torso', can be seen to extend beyond the main surface onto the sides of the support slab. Similarly, the tip of the 'penis' of the enormous 'human' (Motif 16 {p. 628}) continues beyond the edge of the 'canvas', as does the 'tail' of the 'kangaroo' (GTVT-18 {p. 629}), and the top of one of the elements of Motif 35 {p. 638}.

The most typical examples of the 'use of the support', including its integration with the figure, are found in those motifs showing the displacement of the subject. Some motifs take up several slabs, the 'snake' (GTVT-4 {p. 618}), which is 3 m long, covers three slabs all in different positions and with various slopes and gradients. These cause the 'animal' to appear to ripple across the rock surface and therefore add to his character as a 'snake', a snake that is slithering from one block to the next and not statically coiled like many of the other 'reptile' carvings.

The depictions of kangaroo and Emu tracks, especially GTVT-55 {p. 648}, -56 {p. 648}, -57 {p. 649}, -59 {p. 649} and -60 {p. 650}, are repeated identically on several slabs that line the slope. Here again, it is a question of a unique image that uses various supports to portray an animal's movement.

Nevertheless, some figures fit perfectly onto the rock's surface. The extent of the surface conforms to the limits of the figures and they, in turn, seem to embrace the rock surface. Even though, with GTVT-1 {p. 617}, the 'arms' spread further than the panel, the 'body' of the figure is tightly crushed between the slab's edges and hence appears to follow the various curves. The 'kangaroo' (GTVT-9 {p. 622}) lies within the area of a rectangular protuberance that partly determines its vertical position and also the lengthening of its silhouette. The bearing and morphology of an anthropomorph (Motif 10 {p. 623}) fit with its triangular slab, which seems to be a stele into which the figure moulds itself. All motifs that fit perfectly the shape of each block are given a volume—a three-dimensionality—by the block; it is as if the rock itself is transformed into a large 'human' creature (or a 'kangaroo' in the case of GTVT-9 {p. 622}) by the carving.

Various figures are wedged between the cracks. The upper part of GTVT-38 {p. 639}, which perhaps portrays a scene, fills a rectangular space curved over the unevenness of the surface. Various friezes occupy a rectangular area, which, for them, is perfectly adequate; Motifs 70 {p. 656} and 73 {p. 656} and a few multiple forms are arranged in relation to the support's large axis. Hence, the 'fishes' (GTVT-32 {p. 637}) are vertically in the right order on a stone extended in this direction, and the 'coital' scene (GTVT-15 {p. 627}) is beautifully and harmoniously fitted into a long surface area.

Certain representations appear to change their shape specifically to fit into their support. The large 'kangaroo' (GTVT-28 {p. 632}) carries its 'tail' in an unusually low position to allow it to follow the edge of a deep crack. The 'ghost figure' (Motif 86 {p. 661}) holds its 'arm' in a peculiarly abnormal position to avoid an area of coarse stone on which it is impossible to carve. Other motifs become elongated and grow strangely out of proportion merely to respond to the rock's enticing invitation. The characters, some threadlike and spindly, others slender, are themselves placed on greatly elongated slabs (for example, Panels 16 {p. 628} and 29 {p. 634}).

Orientation and visibility of the carved surfaces

Certain panels are clearly visible and others somewhat hidden. The visibility of a petroglyph does not simply depend on the positioning of the rock surface, but also on the support block's size and, furthermore, its location on the valley slope, where it may be partly concealed by other rocks. For each carved surface, I recorded its orientation and relationship to the top of the block.

Orientation

The diagrams of the compass orientations of the carved surfaces (Fig. 7.27) show that the carvings on the southern slope are mostly facing towards the north and the northeast. Two-thirds of the carved surfaces also face the northern sector between northwest and northeast.

One fifth of all carvings are set in a horizontal position

on the top of a stone slab. On the northern side, southwest and southeast orientations represent 70%, and the horizontal figures just 11%. Therefore, the carved surfaces on both sides are mainly turned towards the thalweg. To try to find out if this orientation is the result of a choice, or if it is brought about by the natural accessibility of the rock panels, an area was arbitrarily demarcated on the southern slope and, within this area, all the positions of the rock surfaces, whether carved or not, were recorded. The diagrams (Fig. 7.27) clearly show that certain orientations were favoured. A comparison was made of the available surfaces in the test area with those of all the carved surfaces on the southern slope of GTVT; the results show that the carvers chose to work on the surfaces facing towards the north. Furthermore, they neglected the surfaces facing towards the south and, indeed, they did not carve the slab-tops there as much as the natural landscape would have permitted (Fig. 7.28).

Evidence of visibility: The Visibility Index

The carvings from the top of Gum Tree Valley were classified into three categories:

Petroglyphs visible from afar (more than 10 m); these represent 22% of the total;

Petroglyphs of medium visibility, perceptible from a few metres away; these represent 67% of the total;

Concealed petroglyphs visible only from about 2 m; these represent about 11% of the total.

This grading confirms that the carvers wished their work to be exposed for all to see. The most visible petroglyphs are mainly human representation, often of a large size and the 'ghost type' (52% of the figures displayed). There are also a few 'animals' (19%), a small number of geometric forms (12%), and the rest are indeterminate.

The concealed figures appear to be mostly geometric motifs (52%) and occasionally small stick-figures (10%) or indeed 'animals' (15%). Unfortunately, the small number of 'animals' that could be considered as 'hidden' does not make the statistics unequivocal. This is merely an indication.

To conclude, most the carvings from GTVT were deliberately placed on the rock surfaces that could be seen by every visitor who stood at the bottom of the valley. Therefore, they are orientated towards the areas where a set of stone tools and various shells were discovered. Yet, the discreet placing of certain small geometric motifs makes us wonder if perhaps a small number of figures were intended not to be seen by all.

Current visibility of the petroglyphs

The carvings of Gum Tree Valley's summit are usually deeply patinated and are now difficult to see by an untrained eye. It is obvious that they were much more distinct when they were first completed and thus remained well defined for some time.

Today, the light determines how the carvings can be perceived and deciphered. Some motifs may even be completely unnoticed if they are not studied at the appropriate moment. Deciphering with artificial light at night or at sunset proved to be useful. The opportunity does not simply depend solely on the support's orientation, but also on the technique used and how well the carving has been conserved.

Some figures, those that were made by superficial, relatively recent hammering-pounding, and that are not yet entirely weathered are those that are the most evident when in the shade. They stand out plainly against the darkness of the gabbro. In contrast, severely weathered and pecked motifs are revealed by oblique rays of light from the rising or setting sun that throw shadows on the minor cavities of the carvings. Generally, when the sun is at its height—when the rays are most intense and vertical—the petroglyphs tend to disappear, whereas most carvings are much more visible if the sky is overcast, giving a dull and diffuse light. The angle of vision is also extremely important. It is best to walk around a decorated surface; looking at the subject sideways from a few metres away can sometimes give more details than a close-up, perpendicular, view.

All these observations show that a cursory examination does not suffice and will inevitably produce mistakes. Despite its many advantages, an instant photographic recording is incomplete. When I made the recordings, I noted the time at which each figure became clearly visible and the time when it was most striking. Obviously, these moments depend on the season. (Fieldwork was carried out during the dry season.) The results (Table 7.9) indicate that about one third of the carved surfaces are visible both in the morning and evening; one fifth are visible only in the evening and the same proportion only in the morning; one tenth are visible all day; 4% are barely visible at all times, and the others can be seen at different periods around the middle of the day.

It is useful to know when the conditions of visibility are at their best, because it means that if, for example, we visit Gum Tree Valley Top in July between 1100 and 1500 hours we would probably see only 40 or 50 of the 418 petroglyphs that have been recorded. This observation shows that recording (including tracing) is absolutely necessary in the study of such petroglyphs. If one relies on photographs alone, without tracing and without a long stay in the study area and including visits to the site at different times of the day, including at night, the archaeologist would obtain very biased data and would register mainly the most visible petroglyphs, that is, the more recent ones.

It is possible to envisage that, when the carvings were first completed, they were visible all day long. Yet with constant weathering, the periods during which we can see the carvings have gradually diminished and this phenomenon certainly had an influence on the repeated use of the figures over thousands of years.

Table 7.9. GTVT. Proportion of petroglyphs visible at various times of the day.

time of day when visible	proportion (%)
morning and evening	35
morning only	20
evening only	20
all day	10
at all times	4
various times	11
	100

Carving techniques and patination observed at the Summit Gum Tree Valley

Descriptions of carving techniques

The carvers of Gum Tree Valley Top used four techniques: linear pecking, intaglio, hammering-pounding and scratching.[7]

Deep pecking—linear

This is equivalent to line-drawing and is most common since it is used in 70% of the figures of the GTVT Group. Linear pecking consists of an alignment of small, roundish cupules from 7–15 mm in diameter (mean: 10 mm), and from one to four mm in depth. The effect was obtained by impact with a pointed tool (probably by direct percussion rather than by using a punch placed on the surface: Fig. 7.29), and the mass of the tool enabled the weathered surface of the gabbro to be fragmented to reveal the inside rock, which is a lighter colour. The edges of these petroglyphs tend to be damaged and uneven because of splintering and corrosion.

In this part of the valley, the pecking is particularly crude. There are two variants:

1 Pecking with large dots, separated by a space of about 10–20 mm. This category comprises approximately 40% of all the GTVT petroglyphs. Motifs made with this technique mostly depict humans and animal in large sizes; and
2 Pecking with small, juxtaposed dots, which establish a wide line, slightly concave compared to the surrounding surface. This technique was used to make about 30% of all GTVT petroglyphs, typically to depict motifs of smaller dimensions than the previous category, and particularly human stick-figures.

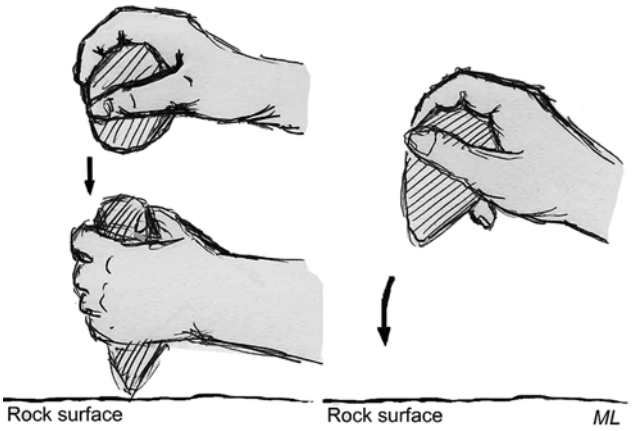


Figure 7.29. GTVT. Percussion techniques. Left: Indirect percussion using a hammer and stone punch. Right: Direct percussion using a stone hammer.

With eight of the figures (GTVT-1 {p. 617} to -4 {p. 618}, -19, -78, -96 {p. 666}), the pecking consists of small elongated cupules ranging from 10–30 mm in length, and aligned in rows that are approximately parallel. They were made using an angled pecking, by the dragging of the tool's tip to form a short groove. Six of these figures are grouped together (Fig. 6.30; GTVT-1 {p. 617} to -4 {p. 618}, -19 and -96 {p. 666}). This adds to the distinctive character of this technique and invites us to conclude that they are contemporary.

Deep pecking—intaglio

Twenty percent of the motifs exhibit an outline that is entirely pecked. This corresponds to the field of painting using flat, uniform colours ('*teintes plates*'). Intaglio is known in rock

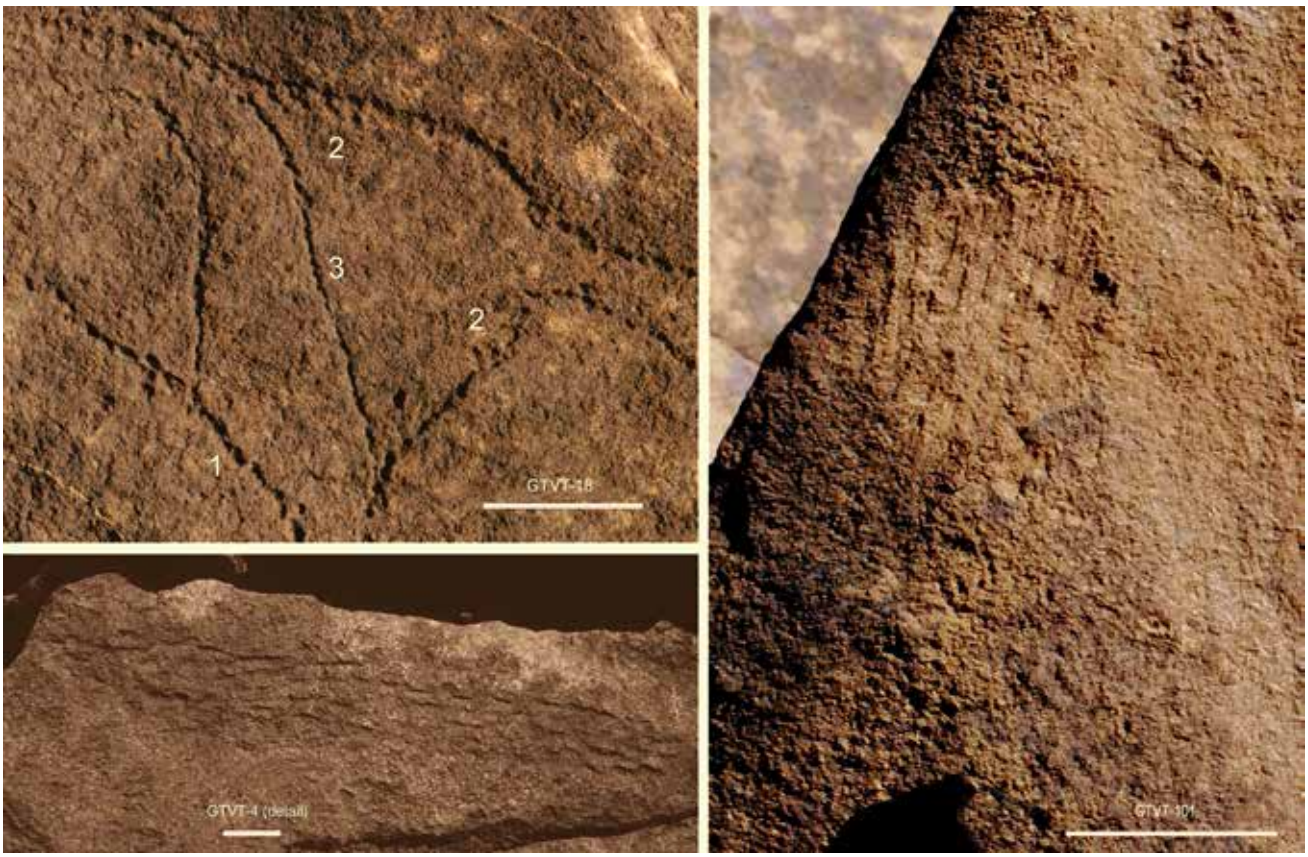


Figure 7.30. GTVT. Examples of linear pecking (all deeply patinated). Scales 100 m. *Upper left*: *(1)* simple deep linear pecking; *(2)* double linear pecking; *(3)* deep thin linear pecking. (Detail of 'kangaroo' GTVT-18). *Lower left*: example of pecking with elongated punctures. (Detail of 'snake' GTVT-4). *Right*: an example of 'scratching' technique (GTVT-101).

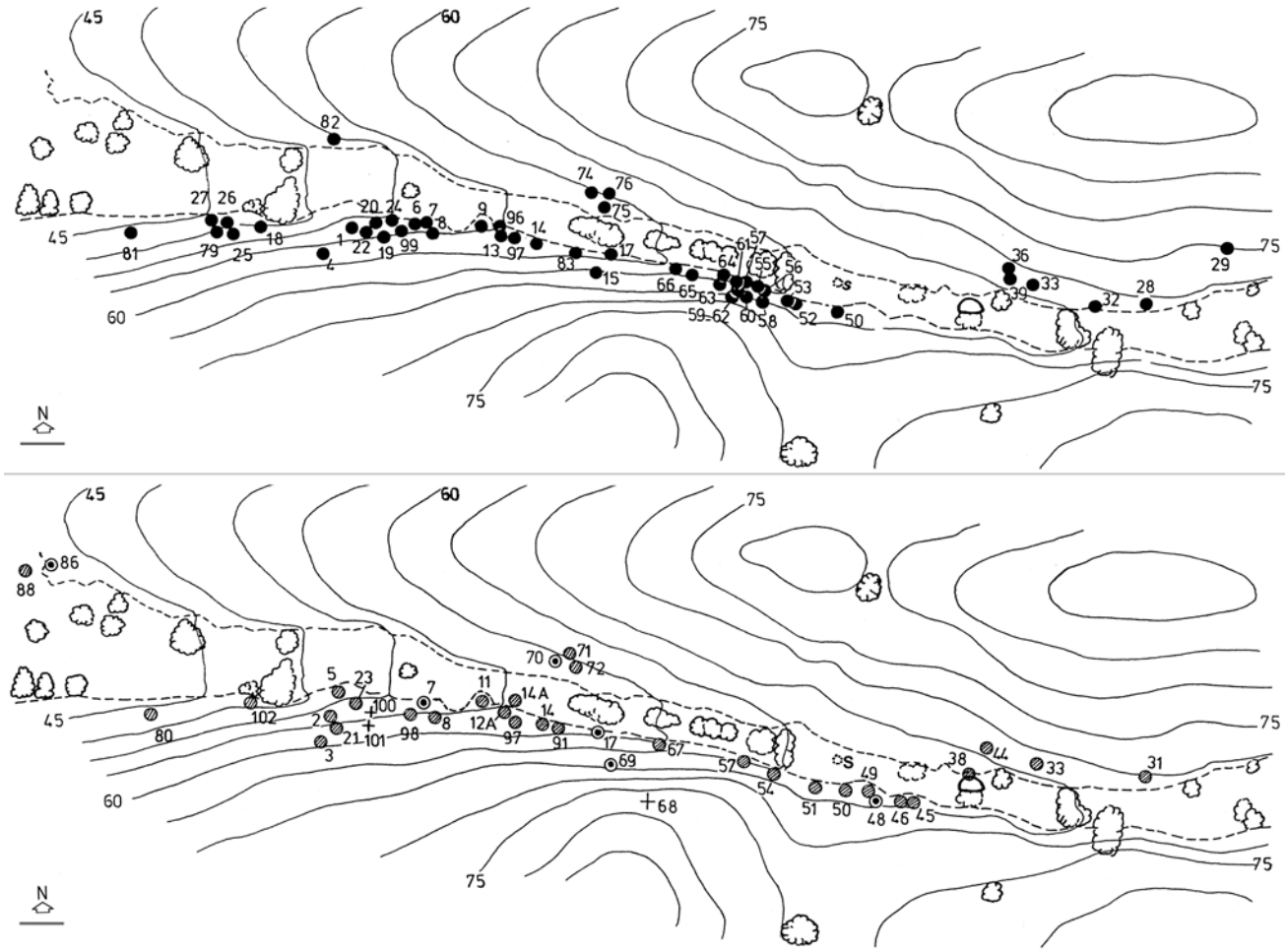


Figure 7.31. GTVT. Distributions of carving techniques. Scale: 10 m. *Upper map:* ● = linear pecking with separated dots. *Lower map:* ● [hatched circle] = intaglio; + = scratching and scraping; ⦿ = linear pecking associated with intaglio on the same figure.

art all over the world. It is much less frequent than linear pecking probably because it requires much more time and effort. Although coalescing, the cupules remain visible and the image becomes separated in a hollow of two to four mm in depth.

In only 33 human or animal representations (either complete or reduced to their 'print') was the intaglio technique adopted. Linear pecking and intaglio are contemporary, as revealed by the observation that nine petroglyphs display a combination of the two processes. These nine depictions are of large 'humans' or 'animals' outlined in linear pecking, which determine the different sized areas. Their 'limbs' or 'heads' can also be completely pecked even though the drawing of the 'body' is linear. Moreover, certain petroglyphs that are entirely pecked show that they were started first by a contour line. These two techniques are evidently complementary.

Superficial pecking—hammering-pounding

Only six figures were carved by a superficial hammering-pounding technique. This technique destroys the thin layer of weathering, giving an image usually lacking depth and with contours that lack precision (examples are Motifs 10 {p. 623}, 38 {p. 639}, 87, 90 {p. 663} and 93 {p. 664}). Even though it is somewhat unusual, the technique used with GTVT-90 {p. 663} can be included in this category. It reminds one of the 'Climbing Figures' in one of the valleys of the northern part of Dampier. The contour lines are well-defined, schematic and include acute angles. Here, the figure is clearly concave (with a depth of 7 mm). The base is flat, worn and smooth, which is the result of intensive and extremely painstaking hammering-pounding.

Other techniques—scratching and scraping

Three petroglyphs (GTVT-68 {p. 654}, -100 {p. 666} and -101 {p. 667}) are made up of striations, smooth at the bottom to the point of being polished, with a width from five to ten mm and a depth of five mm. These were achieved by scratching the weathered surface with a sharp, narrow, scraping tool, which inscribed several strips striated in the rock (Fig. 7.30). They are probably simple marks, consisting of the removal of the gabbro powder rather than an intentional picture. Motif 68 {p. 654} could, however, be a drawing of a foot or hand, since it portrays five indentations at one end that could be seen as 'fingers' or 'toes'. The originality of this technique establishes a link between these three petroglyphs that, moreover, are extremely old because they are severely weathered.

They recall the similar petroglyphs of the Kangaroo Group (GTVK). I think that they are 'ritual marks' as is the case at GTVK where they are associated with a 'dalu site'. GTVT-100 {p. 666} and -101 {p. 667} are close to the mound and the standing stone (GTVT-10 {p. 623}). Motif 68 {p. 654} is also a 'scratching'.

I note that incising is virtually unknown here. Only the large stick figure superimposed on the 'neck' of the 'kangaroo' (GTVT-28 {p. 632}) comprises a long, striated line evoking wide incisions.

Distribution of the various carving techniques

The distributions across the GTVT site of the various techniques are shown in Fig. 7.31.

Technique and typology. The study of the distribution of techniques according to the type of motif allows only a few findings. The human and animal representations were executed with equal frequency in linear pecking and intaglio. In contrast, geometric forms (circles, ovals, arcs and lines), excluding the punctations, were predominantly made using linear pecking. Finally, the five 'turtle' motifs are all carved by intaglio.

Superimposition

Forty-five percent of the carved surfaces on Gum Tree Valley Top are comprised of only one isolated motif, and 40% present several juxtaposed motifs. However, examples of superimposition are present on only 6% of the carved surfaces. The small number of superimpositions and the abundance of isolated figures are among the essential characteristics of GTVT.

The six recorded superimpositions (GTVT-16 {p. 628}, -18 {p. 629}, -28 {p. 632}, -31 {p. 636}, -50 {p. 646}, -64 {p. 651}) do not permit any strong conclusions. In only one case was it possible to establish the order of succession. On Panel 64 {p. 651} the 'kangaroo tracks' were made prior to the carving of the large 'human' figure because the pecked line of the 'arm' of the latter is inscribed across the pecked surface of a track that is clearly concave (6 mm in depth).

Re-marking (renovation)[8]

Cases of re-marked petroglyphs are extremely rare at Gum Tree Valley Top.[9] Initially, only four were recorded:

1. GTVT-1 {p. 617}, which is one of the largest carvings on the site, has four 'eyes'. The two upper 'eyes' are today almost invisible, whereas the lower two are still distinct even if weathered. Therefore, this figure has been partially re-carved: when the two original 'eyes' had disappeared, two new 'eyes' were added. In addition, various parts of the contours of this motif, especially the lower 'body', are of a much lighter shade and display a 'used' appearance, revealing renewed touches and marks and a later hammering-pounding;
2. The large 'snake' (GTVT-4 {p. 618}) shows the same phenomenon: its right-most part, on the third slab, consists of paler pecked surfaces, suggesting a reworking;
3. The large anthropomorph (GTVT-16 {p. 628}) has two 'penises', a lateral pecked one and another central one. The latter is smaller, forked and more clearly defined than the rest of the figure. It was made using a very fine pecking and hammering-pounding, completely different from the coarser pecking used for the remainder of the drawing. Evidently this is another example of a later addition; and
4. The lower panel (GTVT-38 {p. 639}) shows an association between 'human' stick-figures, which are weathered and deeply pecked, and two 'turtles' of a pecked and pounded surface that are of a lighter colour. Therefore, the 'turtles' are of a later date than the anthropomorphic motifs. Also, it was noticed that the upper parts of these motifs were paler than their bases. In fact, their 'head' and 'arms' present a colouring identical to that of the neighbouring 'turtles'. Therefore, it is possible that the 'human' figures were renewed when the 'turtles' were carved.

In summary, the largest carvings on the site, among those that were most exposed to view, were re-carved. This happened at a time when the original petroglyph had already been effaced and changed by weathering.

The Top Group patination

Methods

At the time that I was completing the field recordings of the Top Group—and as I had done for the other Dampier sample zones—I noted several different conditions of patination on the work-sheets describing the GTVT carvings. I distinguished three patination states: 'deeply patinated, 'patinated' and 'fresh'. I also developed a more objective method, measuring the contrast between the figure and the rock surface with the aid of a reliable light meter (the 'Mastersix' made by Gossen).[10] For the measurement of patination contrasts at GTVT, I tried to improve the method applied previously at the other Dampier sites, by measuring contrast in the following fashion:

1. All the carvings were photographed as close as possible to the same time of the day, under the same light conditions, perpendicular to the rock and using the same film type. With each frame, a Kodak grey-card was placed underneath the figure so that its image takes up the lower part of each slide. The films were developed by the same laboratory;
2. The slides were then projected using the same projector onto a frosted screen. The light meter, equipped with its accessory equipment, 'Profiflex', allowed narrowly focussed—that is, to an area limited almost to a point—readings of the densities by back-projection of the image onto a frosted screen. The Kodak grey-card provided the reference to enable comparison of readings carried out on all the slides. The density was thus recorded at about ten points for each motif and on another ten points on the rock-support immediately adjacent to the previous points; and
3. The contrast, that is, the greatest or smallest clarity with which the carvings stand out from the rock-face, is conveyed by the differences between the density of the motif and that of the surrounding rock-surface.

This new method still has to be perfected. However, it has provided an interesting series of contrast values, which allowed the different stages of preservation to be compared, not only those of Gum Tree Valley but also a large majority of the Dampier carvings studied. It also contributes a quantified base to the study of the re-marking of the carvings, because the difference in contrast of two successive conditions of carving is defined by a number.

This method of reading density contrasts using photographic slides is easier than making direct density readings in the field. This is because the slides, when they are correctly made and developed, facilitate and homogenize the readings; also, it is possible to make many readings quickly on the same image. Before setting out the results it is necessary to

Table 7.10. GTVT. Degrees of patination of all petroglyphs. Repeated numbers indicate that different motifs or details are found on the same surface. Numbers with asterisks indicate carvings found on the northern side of the valley. All other numbers indicate petroglyphs of the southern slope.

density contrasts	'deeply patinated'	'patinated'		'fresh'	
	0–0.04	0.05–0.09	0.10–0.14	0.15–0.19	≥0.20
motifs numbered	1, 3, 5, 6, 11, 12, 13, 14, 16, 18, 19, 20, 21, 22, 23, 14, 25, 26, 27, 28*, 29* 30, 31*, 32*, 33*, 33*, 34*, 39, 43, 45, 46, 46, 49, 51, 52, 53, 55, 59, 60, 62, 63, 64, 64, 68, 69, 70*, 71*, 72*, 73*, 74*, 75*, 76*, 77*, 78*, 79, 81, 82, 83, 84, 85, 89, 92, 94, 95, 96, 87, 98, 99, 100, 101, 102	2, 8, 9, 12a, 14a, 15, 17, 35, 40, 41, 44, 48, 50, 50, 52 (detail), 54, 56, 58, 65, 66, 67, 97	1 (detail), 4, 7, 16 (detail), 34* (detail), 35* (detail), 38 (detail), 38b, 38b (detail), 42, 42, 47, 80, 86*	8, 37*, 57, 87*, 88*, 91	10, 38, 38, 38, 90*, 93
totals (%)	59	18.3	12.5	5	5

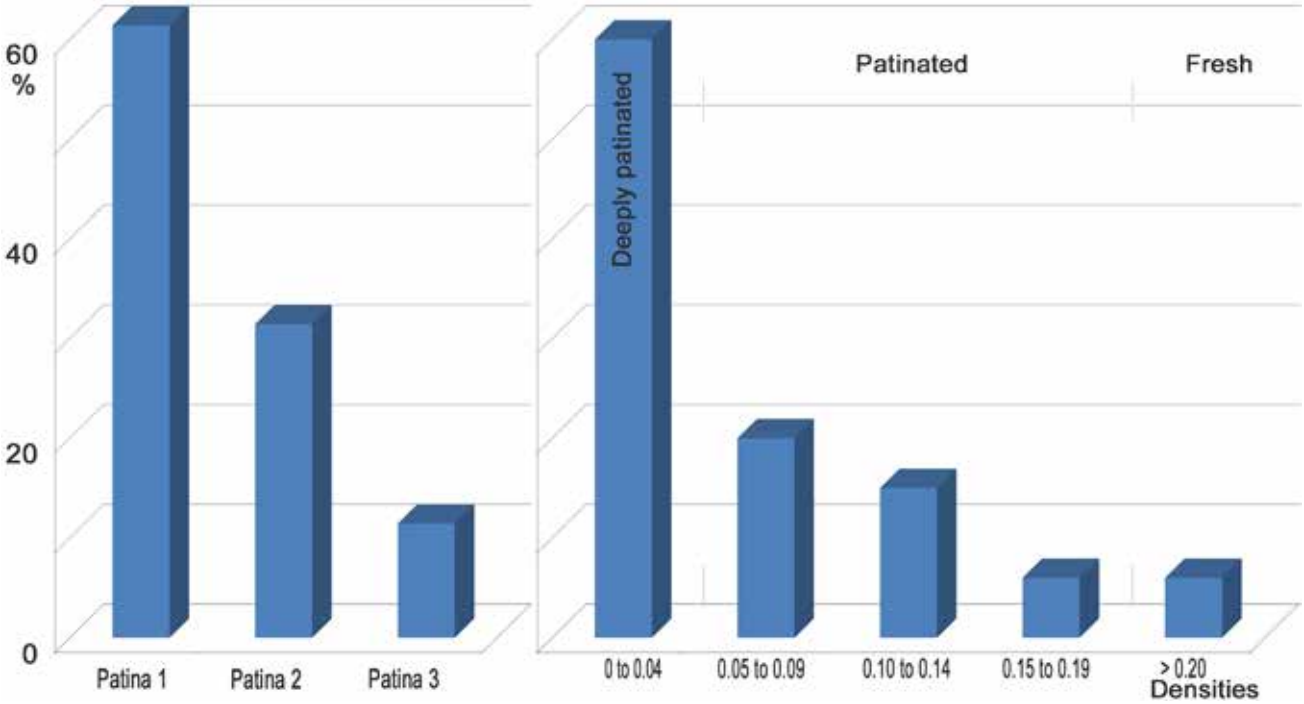


Figure 7.32. GTVT. Categorization of proportions of patination. Left: visual evaluation. Right: photoelectric measurement. Horizontal axes = densities (%).

indicate the difficulties encountered during these operations to show in which direction later improvements could be made.

Illumination

The pecked carvings are most visible under a low-angled light, that is, viewed early in the morning or late in the evening, because the shadows then bring out the depression formed by the carved surface. But the density measurements can be distorted by the shadows. Therefore, measurements were made only on the illuminated surfaces.

The total elimination of shadows can be achieved by taking a photograph of the motifs in the middle of the day when the sun is at its height (and when unfortunately, the motifs tend to disappear) or by photographing them with a flash held at right-angles to the rock; or photographing them in complete shade. The obstacle of partial shade is especially important for the linear pecking because each pecked point is partially taken up by the shade; this reduces the illuminated surface that can be used for measurement. Complete shade is preferable for pounded or hammered carvings that are extremely superficial. Ultimately, it is uniformity of lighting conditions that is desirable if not necessary, even though the values given by the Kodak chart do permit corrections.

Heterogeneity of the rock support

The blocks supporting the petroglyphs rarely display homogeneous colouring, especially the gabbro, which is a very granular rock, and much more variable than the granophyre. The surficial weathering of the gabbro produces marks of every sort due to differential oxidation, and sometimes due to presence of algae. The densities that are recorded by this method are not constant. It is therefore necessary to increase the number of measurement points and to use the average values. With certain cases the measurement of limited areas—virtual points—can be replaced by a measurement on a fairly large surface. The use of macro-photography hardly appears to suit the density readings. Photographs were generally taken at a distance of one or more metres to neutralize, where possible, the micro-variations in the naturel shades of colour of the rock.

Table 7.11. GTVT. State of patination and orientation of petroglyphs on the southern slope.

orientation	deeply patinated		patinated		fresh	
number / percent	n	%	n	%	n	%
northern sector	40	64.5	20	62.5	7	87.5
western sector	1	1.6	6	18.8	0	0.0
southern sector	0	0.0	0	0.0	0	0.0
eastern sector	11	17.7	1	3.1	1	12.5
the top of the slab	10	16.1	5	15.6	0	0.0
totals	62	100.0	32	100.0	8	100.0

Proportions

Degrees of patination of all petroglyphs are listed in Table 7.10 and summarized by Fig. 7.32. The density measurements showed that 59% of the carvings of Gum Tree Valley Top can be classed as 'deeply patinated'; their contrast with the rock-surface is non-existent or displays only extremely slight values (that is, values between 0 and 0.04). Thirty percent are 'patinated'; their density contrast varies from 0.05 and 0.14. Ten percent are 'fresh' (or even 'crisp') with density contrasts greater or equal to 0.15 and which reach, in one case, a value of 0.33 (Fig. 7.32). These percentages confirm the abundance of deeply patinated carvings in this part of Gum Tree Valley—an observation deserving of emphasis.

The degree of patination probably reflects the age of the petroglyphs; the majority of the carvings of Gum Tree Valley Top seem to be very old. However, other factors could have influenced the formation of the patination, especially the orientation of the carved surface and the carving techniques. I will attempt to verify the importance of these factors. Finally, the relation between the patination and themes, and the topographical distribution of the different degrees of patination within the site, will be the subject of further studies.

Patination and orientation

The 'deeply patinated' figures are dominant on the two slopes of the valley, 56.6% on the southern slope, and 65% of those on the northern slope are extremely weathered. In addition, a small percentage of 'fresh' figures were recorded on both slopes (8% on the south and 17% on the north).

The small number of carvings on the northern slope did not enable more advanced comparisons. Nevertheless, these findings suggest that the positioning of the petroglyphs on whichever slope does not appear to have a determining influence on the formation of the patination.

Furthermore, there is no systematic relationship between the degree of patination and the orientation of the carved surfaces, whether they are 'deeply patinated', 'patinated' or 'fresh' (Table 7.11). That is, whatever their state of preservation, the large majority of the carvings are orientated towards the thalweg. The proportion of carvings on the southern slope, for example, which are orientated towards the north, remains easily in the majority (>60%) whatever the extent of weathering: The 'fresh' figures of this slope face towards the north just as frequently as those which are 'deeply patinated'. The better-preserved figures do not appear to be orientated in any particular way.

However, as shown in Table 7.11, nearly 19% of the 'patinated' carvings on the southern slope are oriented toward the western sector, whereas only about 1.5% of the 'deeply patinated' carvings display a similar orientation. So, could it be that the western orientation favours the preservation of the carvings? Indeed, this would contradict what has just been stated. Do these slight data support the case, in contradiction of the previous conclusion, for a western orientation favouring the preservation of the carvings? They are less than conclusive, and it becomes even less likely when we consider the fact that not one 'fresh' figure faces towards the west.

Finally, given the small sample of 'fresh' and 'patinated' petroglyphs, only one general conclusion can be stated: According to my observations, *any influence of orientation of the carved surfaces is not advantageous here to their state of preservation and patination; it does not appear to be a determining factor in this part of the valley at least*.

Patination and technique

The relationships between four techniques recognized at GTVT (linear pecking, intaglio, hammering-pounding, and scraping) and the degree of patination of the petroglyphs are presented in Table 7.12.

If the 'deeply patinated' and 'fresh' carvings are considered successively, one notices that the incidence of surface techniques increase, and the linear-pecking technique disappears. In fact, we notice that linear pecking decreases and then disappears whereas the intaglio increases in frequency.

In addition, a new technique (which is also a 'working' of the rock's surface) appears among the 'fresh' figures, that is, 'hammering-pounding'. This new technique marks a break between the 'deeply patinated' and the 'fresh' figures. The latter form a small group of 12 examples that clearly stands out from the rest of the 'patinated' or 'deeply patinated' carvings.

The 'freshest' surface at Gum Tree Valley Top is the pounded 'human' figure on Panel 10 {p. 623}, exceptional for its stele-like form, which emerges from an artificial mound of stones (a 'cairn'). The contrast of this figure with its support is emphasized since it attains the exceptional patination value of 0.33.

Table 7.12. GTVT. Relationship between carving techniques and degree of patination. Note: some petroglyphs that have been re-marked exhibit more than one patination state.

carving technique	degree of patination (%)		
	deeply patinated	patinated	fresh
linear pecking	64	52	0
intaglio	33	48	46
hammering-pounding	0	0	54
'scraping'	3	0	0

Table 7.13. GTVT. Relationships between patination and themes.

theme	deeply patinated		patinated		fresh	
	n	%	n	%	n	%
'humans'	23	31.5	16	44.4	7	43.8
'animals'	14	19.2	4	11.1	3	18.8
'tracks'	15	20.5	7	19.4	3	18.8
geometric forms	9	12.3	4	11.1	0	0.0
indeterminate	12	16.5	5	13.9	3	18.8
totals	73	100.0	36	100.0	16	100.0

Table 7.14. GTVT. Presence or absence of various motifs in relation to patination.

theme		deeply patinated	patinated	fresh
'humans'	'ghost-like' figure			
	stick-figure			
	other 'human' motif			
	'coital scene'			
'animals'	'kangaroo'			
	'bird'			
	'snake'			
	'turtle'			
'prints'				
geometrics	circular forms			
	oval forms			
	punctations (dots)			
	arc-like forms			
	bi-lobed forms			

strong presence	
slight presence	
sporadic presence	

Patination and themes

The various motif themes, classified in relation to the objectively measured patination contrasts, are presented in Table 7.13. This summary provides only a basic idea of the distribution of the themes according to their patination, because the low figures on which the statistics are based (particularly for 'fresh' or 'patinated' motifs) render certain comparisons barely statistically significant. It is sufficient to note that the 'human' figures, 'animals' and 'tracks' are found among every category of patination, whereas the geometric motifs are not among the few 'fresh' figures at Gum Tree Valley Top.

In considering further the distribution of the various themes according to their patination, it is preferable to indicate their 'presence' or 'absence' rather than using percentages. Table 7.14 shows that the 'human' stick-figures or 'ghost-figures' are mainly the ones that are 'deeply patinated'. They do extend into the category of 'patinated' motifs, whereas the 'fresh' human figures are of a different and varied type.

There are only a few 'coital scenes', and these are among the 'patinated' motifs. Depictions of kangaroo are either 'deeply patinated' or 'patinated', and those of turtles are somewhat sporadically represented across all three categories. Geometric motifs are few. The existence of several bi-lobed motifs in the 'patinated' category can be mentioned without knowing if their absence elsewhere is significant.

Re-marking of carvings

Only five instances of renovation of motifs were recorded among the GTVT Group (Motifs 1 {p. 617}, 4 {p. 618}, 16 {p. 628}, 38 {p. 639}, 57 {p. 649}). These were described in the section above entitled 'Descriptions of

carving techniques'. The density measurements allowed extra precision, enabling the contrast of hue to be measured between two successive re-markings. The re-marking was, in fact, always only partial.

The large 'ghost' figure (GTVT-1 {p. 617}), for which the contour contrast is non-existent, shows the addition of two 'eyes' and a 'nose', whose contrast factor is 0.11. The 'snake' (GTVT-4 {p. 618}) near the first figure, displays the same phenomenon with an equivalent contrast value. The forked 'penis' added to the large 'human' figure (GTVT-16 {p. 628}) not only provides a considerable contrast to the original carvings (which is entirely 'deeply patinated'), but also a very fine-pecking technique (like that of 'hammering-pounding') and yet different to the silhouette which it completes.

On Panel 38 {p. 639}, the density measures confirmed a development that took place in two stages:

1 the execution of stick-figures, which still present a contrast factor of about 0.10 with the surrounding rock; and

2 re-marking of the figures' tops using a brief hammering-pounding that produced lighter areas where the average contrast with the rock is about 0.30.

Two 'turtles', which are crudely and superficially pounded, were added to the right of these stick figures. Since the 'turtles' have the same contrast factor as the renovated parts of the adjacent 'human' figures, it appears that the making of the 'turtles' and the re-touch of the 'human' figures happened, if not at the same moment, at least within the same period. They can be classed as 'contemporary'.

Finally, the measurements confirmed the re-marking of two 'bird tracks' (GTVT-57 {p. 649}). The interior of these prints was re-pecked as evinced by the density values recorded along the section across one of these 'tracks' (Fig. 7.33).

The sides of this concave carving remain from the original 'track', of which only the central part was renewed. The integration of these two completely pecked motifs into a series of linear pecked 'tracks' can be explained by the observation that, at a later stage, the two were transformed into intaglio.

The contrast measurements also enable a panel's heterogeneity to be emphasized. For example, the surface of Panel 35 {p. 638}, which bears four motifs, was used twice, as the density measurements show: The linear motif to the left (contrast factor 0.07) was carved first, and the three forked motifs to the right (mean contrast value of 0.13) were added later.

Topographical distribution of the patination

'Deeply patinated' carvings were recorded across the entire site, with a particularly dense concentration in the western part of the southern slope where two small groups can be identified (Figs 7.34, 7.35). On the other hand, the 'patinated' carvings are most numerous in the eastern zone. The 'fresh' carvings, which are few, are widely distributed; GTVT-87, -88, -90 {p. 663}, at the entrance to the valley in the northwest, are within an area where there are no 'deeply patinated' carvings.

Conclusions about GTVT petroglyphs

The petroglyphs at Gum Tree Valley Top are mainly 'deeply patinated' petroglyphs that are barely distinguishable from their support surfaces. There is a smaller number of 'patinated' carvings, and only about 12 'fresh' motifs. These characteristics define the Top Group; they are not typical of the groups of Gum Tree Valley or Skew Valley, where the proportion of slightly patinated motifs is generally much higher.

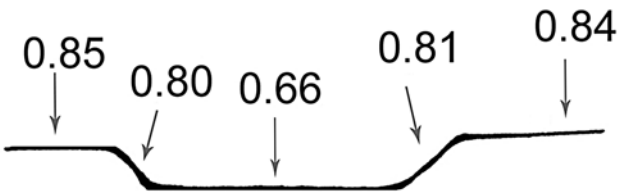


Figure 7.33. GTVT-57. Cross-section though re-marked 'bird track'.

Since they are the result of several complex processes, influenced by various factors, patination studies often justly arouse the researcher's mistrust. For example, the carving technique used can influence the development of patinae. A deeply-pecked motif will weather more slowly than a superficial hammering-pounding, and intaglio will resist weathering better than linear pecking where the dots are more quickly overtaken by oxidization. The role played by certain algae also should be considered: the presence on the site of motifs that are duller than their support rock can be due to micro-organisms, which, in some cases, have a selective effect on carved surfaces. Whatever they may be, these complex phenomena, difficult to analyse, do not appear to have had a deciding influence since all the observations made in this chapter eventually *confirm the chronological value of the patination*.

Within a site, with identical conditions and techniques that are virtually the same, the deeply patinated figures are undoubtedly older than those with a lesser degree of patination.

At GTVT the supporting rock's orientation was not seen to influence the weathering because the large majority of the figures are widely exposed to all weathers and turned towards the thalweg.

Based on my study of the patination of the GTVT petroglyphs, I can propose a first draft of a chronological classification of these petroglyphs: I can already distinguish—these will be developed further later—two successive periods of unequal lengths:

1 an early phase, of long duration since it would include both 'deeply patinated' and 'patinated' motifs, representing 90% of carvings. The homogeneity and long duration of this phase are demonstrated by the persistence of certain themes—such as 'ghost-like' figures—both 'deeply patinated' and 'patinated' (which are often old figures renovated). The motifs of this phase are also highly standardised; and

2 a recent phase, very short, marking a departure from the earlier phase in terms of themes, styles and techniques ('human' figures of new and varied types, and the use of hammering-pounding).

The topographic distribution of patination showed that the carvings of the first phase gradually occupied the entire site. At first it was mainly the western sector—here there were several very concentrated groups of petroglyphs. Later, motifs that were a little less patinated than their predecessors became common, especially in the eastern half of the site.

The eastward trend of the carved areas during an early phase ('deeply patinated' and 'patinated' motifs) is clearly shown in Fig. 7.35. The centre of gravity of the petroglyph areas defined by areas of maximum density moved from west to east (bottom diagram).

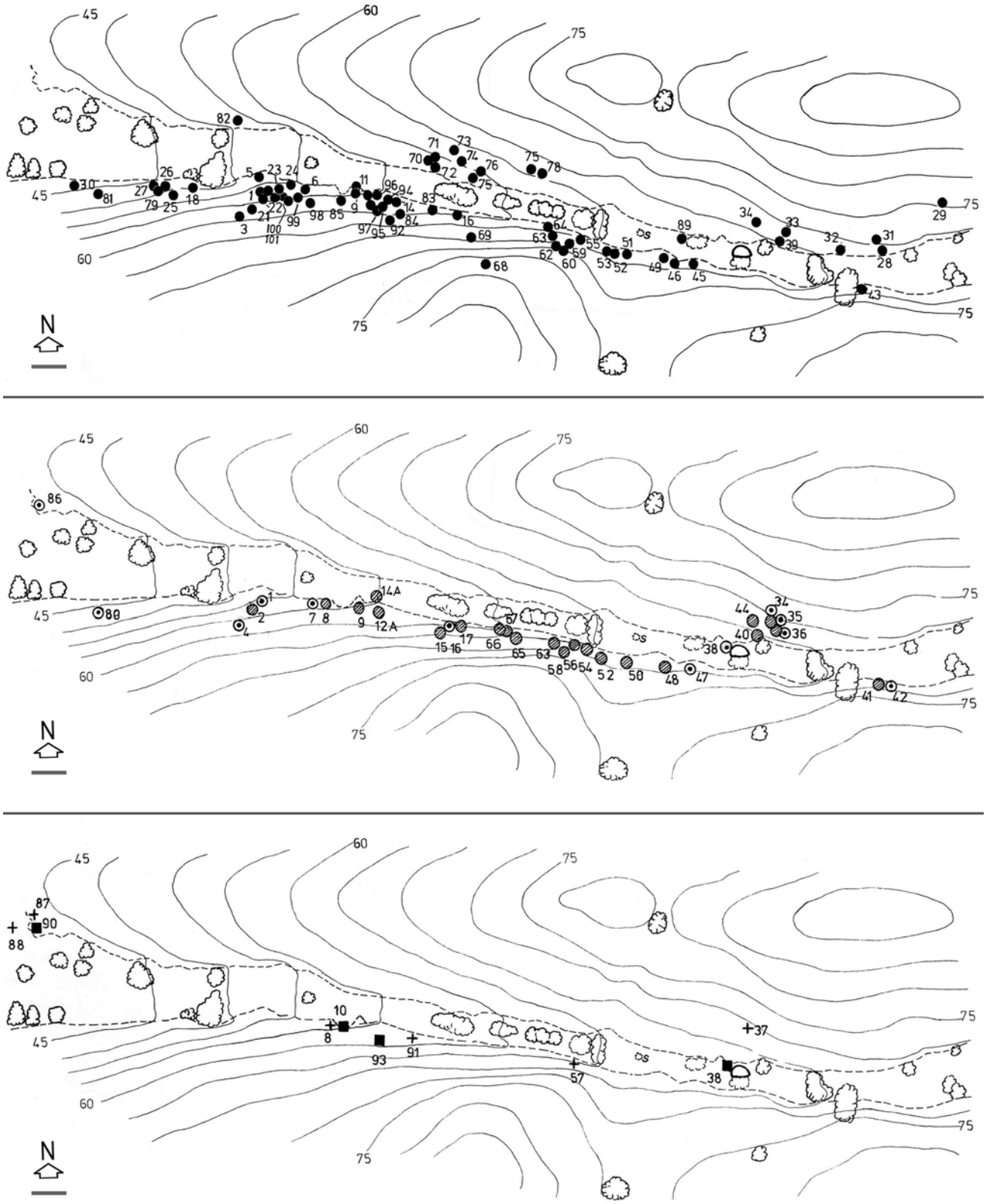


Figure 7.34. GTVT. Distribution across the site of petroglyphs of the three patination categories. Scales: 30 m. *Upper:* 'deeply patinated' carvings. *Key:* ● d ('contrast factor' or 'density') = 0–0.04. *Middle*: 'patinated' carvings, ● [hatched circle] d = 0.05–0.07, ⦿ d = 0.10–0.14. *Lower:* 'fresh' carvings, + d = 0.15–0.19, ■ d ≥ 0.20.

The Top Group cultural remains

Stone tools and shell scatters were found on the ground in the thalweg and in the crevices between the carved rocks. Two artificial hillocks were recorded in the bottom of the valley. These remains were numbered and located on the map of the site.

The GTVT lithic assemblage

Characteristics of the assemblage

The assemblage of 360 stone artefacts was itemized and is summarized in Table 7.15; a full listing (with the shell remains) is provided by Table 7.16.[11] The various elements of this assemblage can be distinguished immediately by

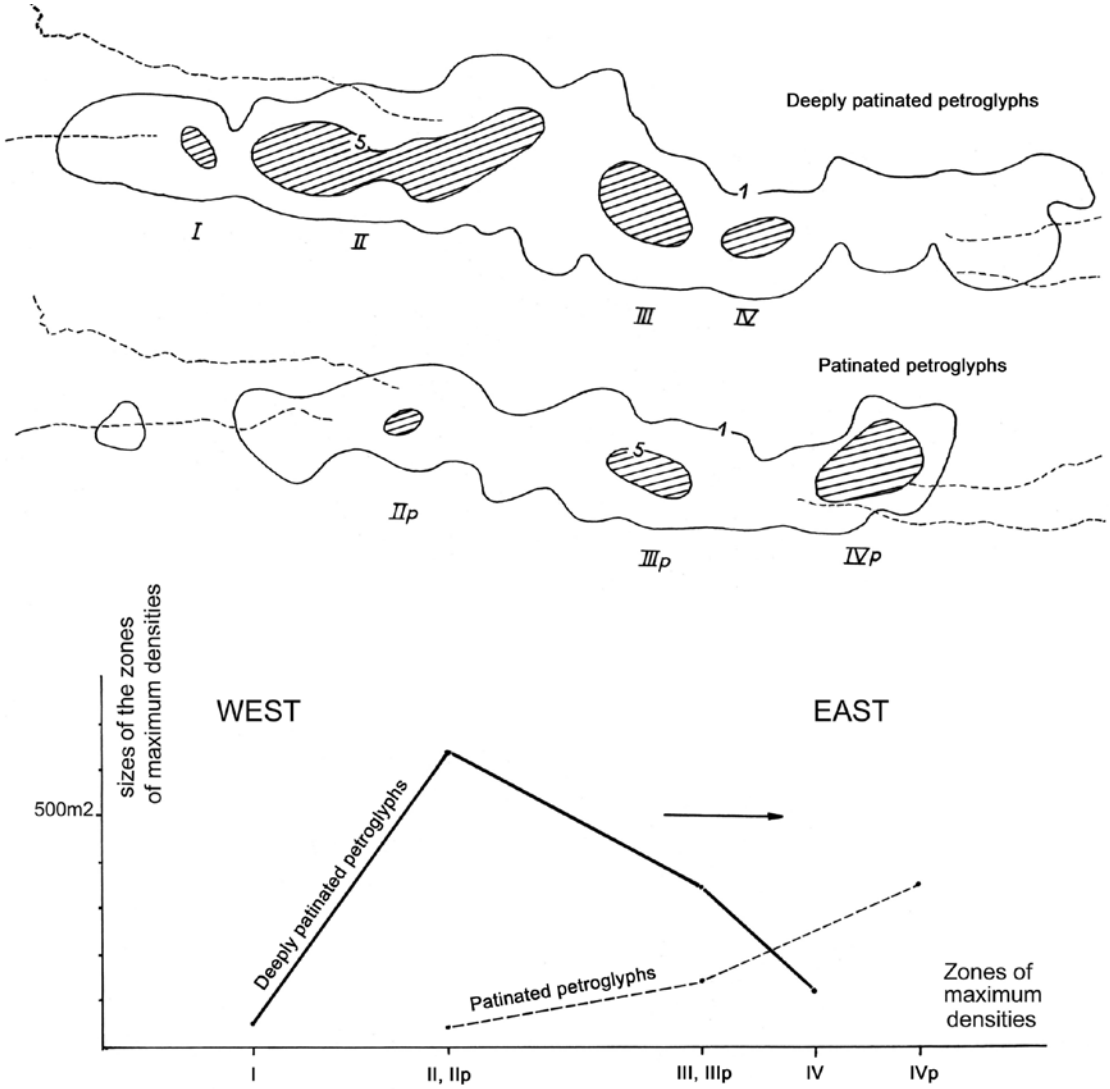


Figure 7.35. GTVT. Topographical distribution of the patination categories. *Upper:* carving distributions by densities. *Lower:* graph showing the shift, over time, from 'deeply patinated' (old) carvings to the less 'patinated' (younger) carvings toward the east of the valley.

their large sizes. These artefacts are bulky; the mean of the largest dimension is approximately 60 mm and the range is from ten to 150 mm. Individual cores weighed up to 400 g. This assemblage stands out because of the high proportions of cores (n=85; 73%). Some pieces match together, which enables some cores to be partially re-constructed (Table 15: items numbered 61 and 62; and 110 and 111). This reveals the existence of periodical stone knapping on the site.

All the fragments were found among the natural stone blocks; the actual ground of the thalweg is formed by a scree of large, fallen and rounded rocks. It is probable that I missed many artefacts scattered among the deep crevices and beneath the rocks. The mass of fallen rocks seems to act as a sieve; the smaller stone fragments, penetrating deeper into the scree, are more difficult to find on such ground, which retains on its surface bulky pieces only. However, there are some earthy areas and a few microliths were found in other parts of Gum Tree Valley. Their absence here certainly is significant.

Stone tools

The scrapers are robust. Thirteen side scrapers were made from flakes or larger pieces, and four from cores. Three have steep edges and the others are flat. The edges are

Table 7.15. GTVT. Number and proportion of various items in the stone tools assemblage.

item	number	proportion (%)
side scrapers	19	5.3
denticulated scrapers	4	1.0
horsehoof cores	6	1.6
globular core	63	17.5
cores with two striking platforms	2	0.5
cores with one striking platform	14	3.8
total tools	23	6.4
total cores	85	23.6
total flakes	252	70.0
total stone artefacts	360	100.0

Table 7.16. GTVT. List of stone tools and shell remains (item numbers refer to Fig. 7.4 {p. 560}—map of site). When the described material is unspecified it is local rock—gabbro (continued on next page).

numbered item	description	numbered item	decsription
1	large flake (green granophyre)	70, 71	two globular cores
2	debris of one 'Trumpet Shell' *(Syrinx aruanus)*; sampled for radiocarbon analysis (Plate 10)	72	flake
3	horsehoof core	73	globular core
4	flake (green granophyre)	74	scraper with thick edge
5	long flake	75	globular core
6	flake	76	flake
7–10	small flakes (green granophyre)	77	globular core
11	concave scraper (white flint)	78	large flake
12, 13	long flakes	79	large flake (quartz)
14–16	flakes	80	flake
17	small flake (quartz)	81	small flake (green granophyre)
18	flake (green granophyre)	82	debris of mollusc *(Melo amphora)*
19	large long flake	83	large flake (green granophyre)
20	small flake	84	small flake (flint)
21	large flake	85	flake (green granophyre)
22	large Levallois flake	86	debris of mollusc *(Anadara granosa)*
23, 24	large flakes	87	large flake
25	flake	88	small flake (flint)
26	large flake	89	small flake (green granophyre)
27	flake	90	flake (green granophyre)
28	side scraper *(grattoir)*	91	two small flakes (flint) and one small flake (green granophyre)
29–33	large flakes	92	flake (green granophyre)
34	flake (flint)	93	globular core (one retouched edge)
35, 36	small and large flakes (flint)	94	large globular core (green granophyre)
38	flake, ten mollusc shells *(Anadara granosa)*	95, 96	two large flakes (green granophyre)
39	large scraper	97	globular core
40, 41	flakes (quartz)	98	horsehoof core
42	small flake (green granophyre)	99	large scraper
43, 44	debris of four *Anadara granosa*	100	horsehoof core
45	flake	101	small flake (green granophyre)
46	large globular core (green granophyre)	102	scraper (green granophyre)
47, 48	flakes	103, 104	flakes (green granophyre)
49	flake (green granophyre)	105	debris of molluscs *Melo amphora*)
50	globular core (green granophyre)	106	small flake (quartz)
51	large flake	107–109	flakes
52–54	flakes	110, 111	two large flakes (including one from a core that has blunted edges (green granophyre)
55	globular core	112	core with one prepared platform
56, 57	three flakes	113	scraper on a core
58	horsehoof core	114	globular core
59–63	four flakes (two connected) (green granophyre)	115	globular core
64	long flake	116	two mollusc shells *Anadara granosa*
65	flake	117	thick flake
66	debris of mollusc (Baler Shell, *Melo amphora*)	118	flake (green granophyre)
67	globular core	119	large flake with a sharp edge
68	large horsehoof core	120	thick flake
69	globular core	121	large concave scraper

Table 7.16 (continued from previous page). GTVT. List of stone tools and shell remains (item numbers refer to Fig. 7.4 {p. 560}—map of site). When the described material is unspecified it is local rock—gabbro (continued on next page).

numbered item	description	numbered item	decsription
122	large flake	175	scraper with sharp edge and flake
123	small flake	176	flake
124	thick flake	177	debris of mollusc *(Melo amphora)*
125	large long flake	178	globular core
126	flake	179–184	blocks
127	globular core	185	globular core
128	core with prepared striking platform	186	small block
129	globular core	187	flake
130	globular core with blunt edges	188	scraper
131	large flake	189, 190	flakes
132	thick flake	191	small flake (quartz)
133	flake (green granophyre), small flake (chalcedony)	192	large flake
134	very large flake (green granophyre)	193	debris of mollusc *(Anadara granosa)*
135	mollusc shell *(Terebralia palustris)*	194	flake
136	small globular core	195	thick denticulate flake
137	three small flakes (quartz)	196	flake
138	large globular core with blunt edges	197	globular core
139	large flake	198	block
140	small flake	199	small globular core
141	globular core	200	flake
142	small globular core with blunt edges	201	block
143	small block	202, 203	flakes
144	large flake	204, 205	globular core
145, 146	two globular core	206	two flakes
147	two molluscs *(Anadara granosa)*	207, 208	blocks
148	globular core with blunt point	209	small globular core
149	long flake	210	large globular core
150	globular core	211, 212	small globular core
151	large flake	213	small flake
152	rough flake	214	flake
153, 154	small blocks	215–218	blocks
155	small globular core	217	scraper made on large flake
156	flake	219	flake
157	globular core	220	scraper made from core
158	small globular core	221	globular core
159	globular core with blunt edges	222	flake
160	large core with two platforms	223, 224	blocks
161, 162	blocks	225	flake
163	globular core	226–229	flakes
164	flake	230, 231	two large flakes (quartz)
165	small globular core	232, 233	blocks
166–168	flakes	234	flake
169	block	235	globular core
170	small flake (quartz)	236–241	small blocks
171	large flake	242	small globular core
172	scraper made on core	243	block
173	flake	244	globular core with blunt point
174	scraper	245	globular core

Table 7.16 (continued from previous page). GTVT. List of stone tools and shell remains (item numbers refer to Fig. 7.4 {p. 560}—map of site). When the described material is unspecified it is local rock—gabbro.

numbered item	description	numbered item	decsription
246, 247	small blocks	307	flake
248, 249	blocks	308	small core with a striking platform
250	thick scraper (green granophyre)	309	flake
251, 252	blocks	310	large flake
253	large thick scraper made from core	311	small globular core
254, 255	blocks	312–315	blocks
256	small globular core with blunt edges	316	small core with a striking platform
257	globular core	317	core with a striking platform
258	flake (flint)	318–320	flakes
259	three flakes, one mollusc *(Anadara granosa)*	321	small horsehoof core
260, 261	flakes	322	block
262	sharp flake	323	large core a two striking platforms
263	mollusc shell *(Anadara granosa)*	324	debris of mollusc *(Melo amphora)*
264	globular core	325	flake
265	two mollusc shells *(Anadara granosa)*	326	mollusc shell *(Anadara granosa)*
266	flake	327	core with striking platform (green granophyre)
267	scraper made from large flake	328	flake
268	seven small flakes	329, 330	large flakes
269, 270	four blocks	331	core with a striking platform
271	two flakes	332, 333	blocks ?
272, 273	flakes (one from a pebble)	334	core with a striking platform
274, 275	blocks	335	denticulated flake
276	flake	336	block
277	fragment of mollusc *(Melo amphora)*	337	flake
278	denticulated flake (flint)	338, 339	flakes
279, 280	small flakes	340	flake (quartz)
281	small core (with point)	341–343	blocks
282	flake	344–347	flakes
283	globular core	348	blade-like flake
284, 285	thick flakes	349	flake
286	globular core	350	scraper
287, 288	flakes	351	flake (quartz)
289	block	352	core with a striking platform
290	globular core	353	flake
291	large flake	354	flake
292	core with a striking platform	355	ten mollusc fragments *(Anadara granosa)*
293	globular core	356, 357	core with a striking platform
294	large globular core	358	denticulate flake
295	globular core	359	flake
296	large flake	360	globular core
297	small core with a striking platform	361–371	debris of molluscs *(Anadara granosa)* sampled for radiocarbon analysis.
298	globular core		
299	two flakes	372	flake
300	scraper (green granophyre)	373	core with a striking platform
301	flake	74, 375	flakes
302	globular core	376	globular core
303, 304	flakes	377	mollusc shell *(Anadara granosa)*
305	core with a striking platform	378	flake (quartz)
306	large flake (quartz)	379	large flake

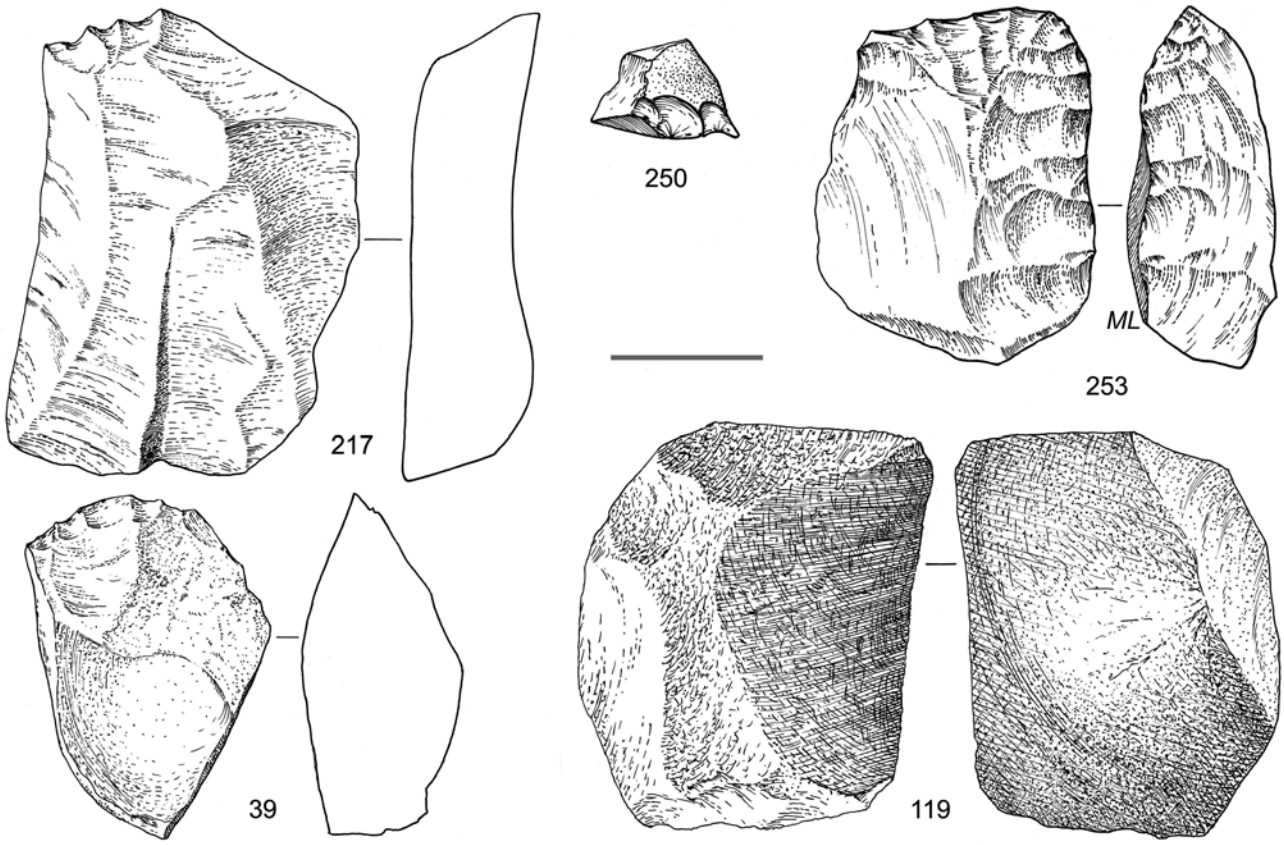


Figure 7.36. GTVT. Artefacts. Scale: 50 mm. 217, 253, 39: Large scrapers (gabbro). 250: Steep edge scraper (green granophyre). 119: Large cutting flake (gabbro).

normally straight or slightly convex; just two are concave. The denticulated scrapers are small side scrapers with wavy edges that are indented with small notches.

Cores

The horsehoof cores are bulky and of the traditional type; the diameters of their platform vary from 50–90 mm and their heights from 50–110 mm. The other types of cores are small, with their largest dimension only reaching 40 mm, while others measure up to 100 mm in length and weigh several hundred grams. Most of these cores are globular without a specific shape. Most have only one striking platform and just two have two striking platforms. Some cores have a thick tip, and six display blunt edges. Such characteristics, as well as the presence of pointed cores and the general abundance of cores, probably reveal their use during the carving. (In other Dampier artefact assemblages, cores are usually much less numerous.)

The largest cores, at least, should be the carvers' tools. That the distribution of this assemblage is concentrated near the carved rocks at the foot of the slopes, and the frequency decreases markedly in the middle of thalweg, reinforces the relationship of these tools with the carvings. The material used is predominately local gabbro.

Examples of elements of the GTVT lithic assemblage are shown in Figs 7.36–7.38. Details of individual stone artefacts recorded at GTVT may be found in Table 7.16, and their source materials in Table 7.17.

Sources of lithic raw materials

Gabbro provides the raw material for 82% of the GTVT artefacts, and particularly of the cores (Table 7.17). Three

Table 7.17. GTVT. Types of stone used to make stone artefacts.

tool type	source material									
	gabbro		green granophyre		quartz		chalcedony		chert	
	n	%	n	%	n	%	n	%	n	%
side scraper	15	79	3	15.8	—	—	—	—	1	5.2
denticulated scraper	3	75	—	—	—	—	—	—	1	25.0
horsehoof core	6	100	—	—	—	—	—	—	—	—
globular core	60	95	3	5.0	—	—	—	—	—	—
platform cores	16	100	—	—	—	—	—	—	—	—
flakes	196	78	30	12.0	17	6.5	1	0.4	8	3.0
totals	296		36	10.0	17	4.7	1	0.3	10	2.7

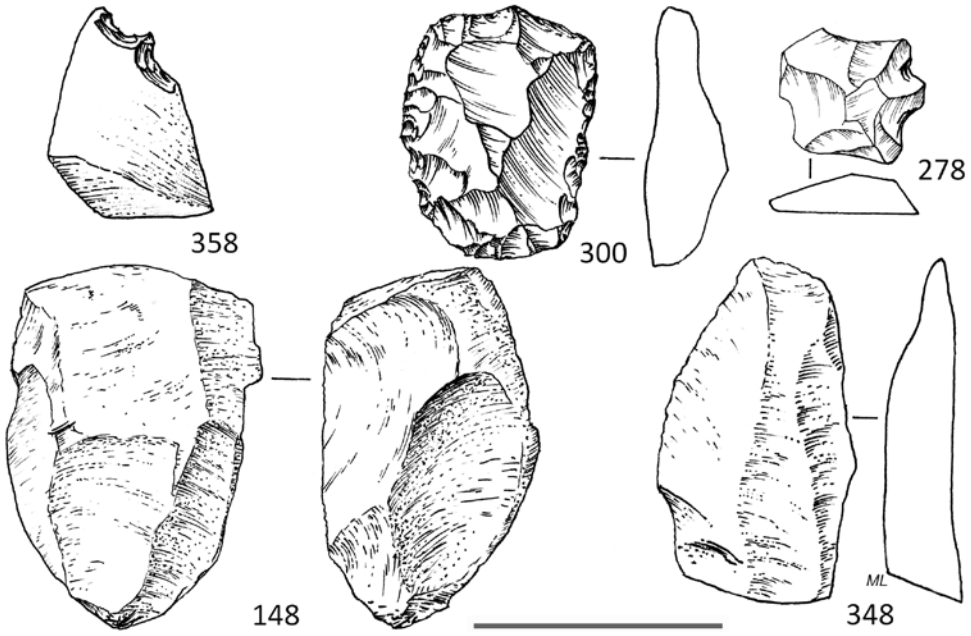


Figure 7.37. GTVT. Artefacts. Scale: 50 mm. 300: Scraper (chert). 358: Denticulated flake (gabbro). 278. Denticulated core (chert). 148: Globular core with worn and smooth point. 348: Blade-flake.

side-scrapers are made from green granophyre, and one from chert. Among the flakes (n=252), the local rock predominates, yet 21% are made of material that has been brought to the site. Twelve percent are made from green granophyre, and 6.5% from quartz, 3% from chert and less than half of 1% from chalcedony.

The GTVT shell assemblage

A few whole, and more often broken, shells were discovered in the site between the rocks of the bottom of the valley. Some others were stuck in the crevices close to the carvings at the foot of the slopes. All were plotted on the map of the site (Fig. 7.4). The total weight of the shell assemblage is about 500 g; it was sampled for radiocarbon analysis. Four shell species were identified, which are the same as those that constitute the coastal middens:

1 The bivalves *Anadara granosa* are the most abundant. This is the most common species in the middens. They are spread all along the Top of the valley with two small clusters at the east and the west of the site. Two of these shells (items numbered 360 and 370) were subject to radiocarbon analysis;
2 A small gastropod, *Terebralia palustris* (which also formed the bottom layer of the excavated Skew Valley midden; a few specimens of this species also were found scattered among the *Anadara* in the top layer of the same midden). Only one *Terebralia palustris* was recovered at Gum Tree Valley Top;
3 Several pieces of large *Melo amphora* (Baler Shell) (items numbered 66, 82, 105, 177, 277, 324). They are scattered all along the Gum Tree Valley Top; and
4 Trumpet Shell, *Syrinx aruanus*. Several pieces, gathered in the same place (Cluster 2 of the map, Fig. 7.4, and on Figs 7.5 and 7.39), were derived from one individual. These pieces were collected for radiocarbon analysis.

These various sorts of shells are linked to different activities:

- *Anadara granosa* and *Terebralia palustris* are remains from the meals of the shell gatherers. They reveal the proximity of the sea. They must belong to a recent period when the sea had reached its present level; and
- On the other hand, *Melo amphora* and *Syrinx aruanus* are less closely related to the sea because they were transported and used by Aborigines as water carriers or as tools to bail out waterholes (as described in ethnographies—e.g., Tindale, 1962a:93).

The GTVT structures

At the centre of the site, at the foot of the southern slope, is an artificial stone mound. The crudely rounded shapes and blunted edges of these gabbro rocks, which appear to be of a uniform length (about 100 mm long), were derived from the thalweg (Fig. 7.40).

North-to-south, this mound measures 2.8 m, and 2.5 m east-to-west; its height is one half metre. Leaning against carved Panel 10 {p. 623}, it looks rather like a small cairn. Having abstained from a detailed excavation for reasons of conservation, no evidence is available to indicate whether this could be a burial place or a place of ceremonial or ritual focus. Panel 10 {p. 623}, from its shape, its position at the top of the mound from which it partly emerges, and from the way it has been carved to represent a human figure of a rather unusual style, resembles a stele. The upper edge has been hammered to obtain flakes as we have seen on many carved slabs at Skew Valley and elsewhere in Gum Tree Valley. The tops of the three surrounding blocks show traces of random punctures as if made with a pointed stone without the action being intended to produce a particular motif. I call these marks 'ritual marks'—produced by hitting the rock near GTVT-10 {p. 623} when engaged in ritual activity (Figs 7.40, 4.41).

Three carvings (GTVT-9 {p. 622}, -10 {p. 623}, -85 {p. 662}) are on the edge of the cairn, along with several

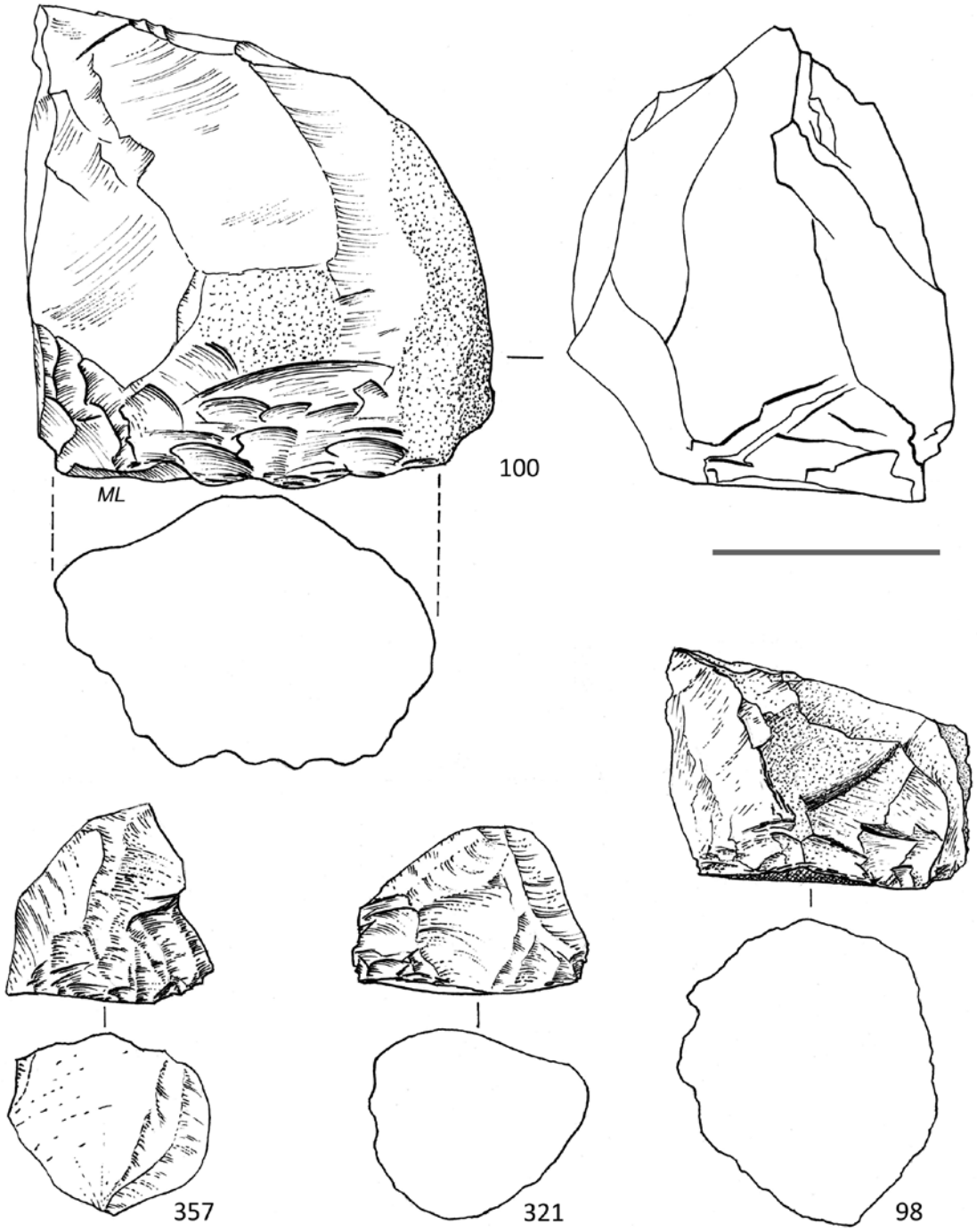


Figure 7.38. GTVT. Artefacts. Scale: 50 mm. 98, 100, 321: Horsehoof cores. 357: Pyramidal core.

interesting artefacts, notably two scrapers and one core (items numbered 217, 220, 221). Moreover, it is around this mound, which appears as the singularly most important point on the whole site, that the most numerous collections of carvings and artefacts can be found.

About 30 m to the east, at the very bottom of thalweg, another small mound of stones just can be discerned; an elongated shape (length 8 m), entirely overgrown with shrubs, it is also probably man-made.

In the eastern section, a few metres north of carved GTVT-50 {p. 646}, I uncovered an unnatural hollow among the stones of thalweg, 600 mm deep and 500 in diameter. This is probably an old water hole giving access to the stream that would run beneath the stones after rain (this is indicated by '5' on the general plan of the site, Fig. 7.4, also Fig. 7.7).

GTVT radiocarbon analyses

Six shell samples that were collected from the surface of the ground of Gum Tree Valley during the last field trip in 1984 were submitted to the radiocarbon dating laboratory of the University of Lyon. Two of these came from Gum Tree Valley Top (LY-3608 and LY-3609).

The LY-3608 sample (weight 190 g) was comprised entirely of *Anadara granosa* shells and shell fragments that were clustered within a few square metres at the western end, that is, near the entrance to the site. The second sample, LY-3609 (134 g) consisted of pieces of the single large shell of *Syrinx aruanus* from east of the soak. The sample locations are plotted on the map of the site (Figs 7.4 and 7.5).

The details of the sample contexts and initial radiocarbon determinations made at the radiocarbon laboratory of

Figure 7.39. GTVT. Shell remains in situ: broken *Syrinx aruanus* (collected for radiocarbon analysis). Scale 100 mm.

University of Lyon are in Table 7.18. Original results were provided by Jacques Evin (pers. comm. 23 November 1985); Philippe Galet applied the 2009 marine calibration curve and the Oxcal program to obtain the calibrated dates (pers. comm. 21 August 2012).

Results of the radiocarbon analyses

The first result, 1510±140 BP (1280–720 cal BP), was as expected. The most recent shell middens on the Dampier coast are made of *Anadara granosa* shells. However, it must be noted that all the 11 carbon dates that I obtained from *Anadara* shells from Skew Valley and elsewhere in Gum Tree Valley are older than 2000 years ago. They range from about 4400–2200 years ago. I had already noted that the Skew Valley midden had been abandoned about 2300 years ago, according to the results from the ANU radiocarbon dating laboratory (Chapter 2, Part II, Addendum, p. 189).

Thus, the results obtained in 1985 from the *Anadara* scattered at the surface of Gum Tree Valley Top are concordant with the dates previously obtained from the Skew Valley midden excavation. It appears that in the area the collection of *Anadara granosa* and probably all shellfish gathering came to an end definitively towards the period 2000–1500 BP.

The result for the second sample (LY-3609), of large pieces of a *Syrinx aruanus*, was unexpected. The shell pieces—parts of one broken shell (Fig. 7.39) in a state of good preservation—were stuck between rocks at the bottom of the valley 7 m from a pit identified as a prehistoric soak. This Pleistocene date (22 290–20 870 cal BP at two standard deviations) is much older than that of any shell midden. At this time, during the last glaciation, the sea level was much lower than today. The coast was about 130 km to the west of the present shore. This unexpected date poses three considerations:

Table 7.18. GTVT. Radiocarbon age determinations.

sample data and uncalibrated radiocarbon results					
sample	sample context		material	laboratory code	uncalibrated 14C ages BP
GTVT-360–370	Valley floor near GTVT-82	surface	*Anadara granosa*	LY-3608	1510±140
GTVT-2	Valley floor near GTVT-49	surface	*Syrinx aruanus*	LY-3609	18510±260

calibrated radiocarbon results generated by Oxcal					
laboratory code	radiocarbon age	one sigma ranges	rel. area	two sigma ranges (rounded) Delta R = 52+35	rel. area
LY-3608	1510±140	766–1330 cal BP	1	720–1280 cal BP	1
LY-3609	18510±260	20960–22360 cal BP	0.8	20870–22290 cal BP	0.976

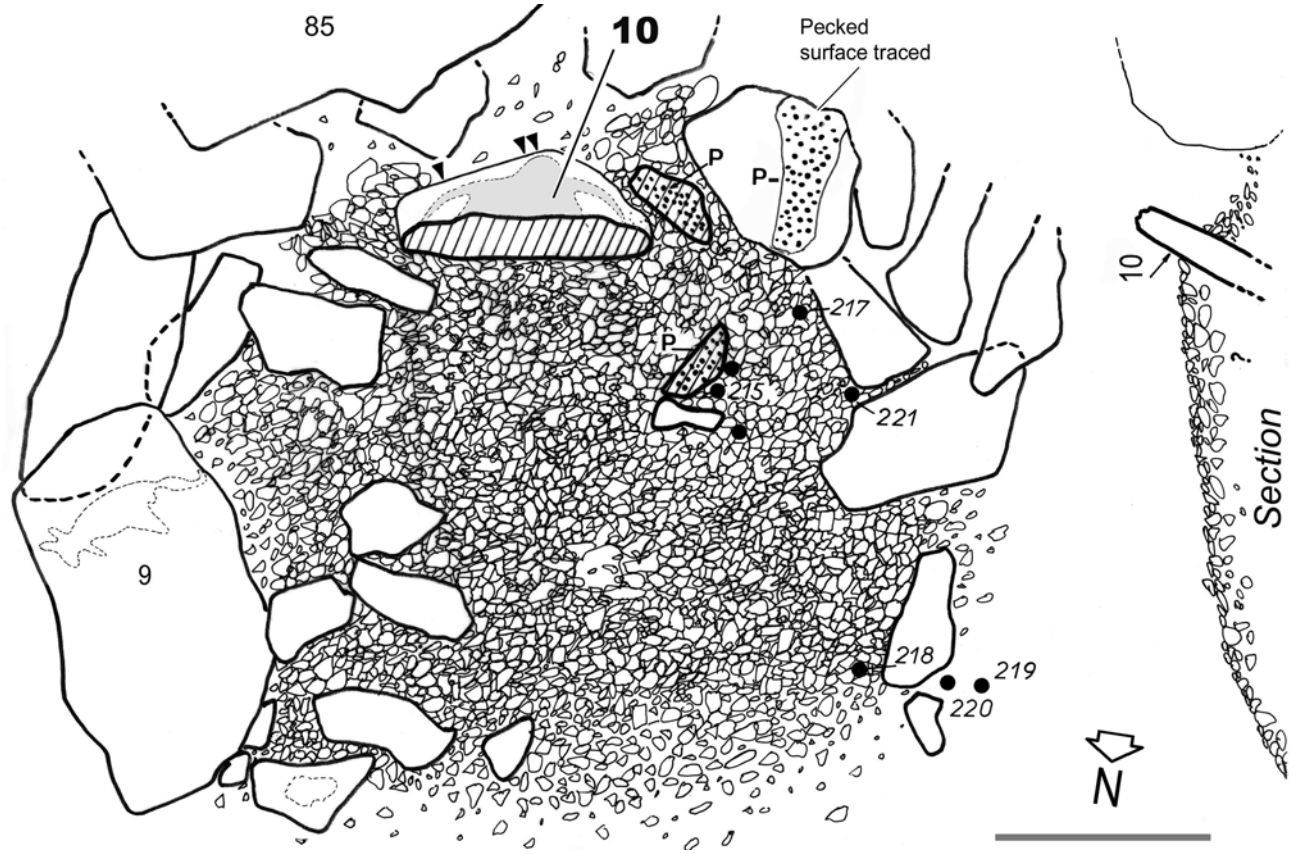


Figure 7.40. GTVT. Plan and section (on right) of cairn associated with carved block GTVT-10, the top of which was hammered to obtain flakes. Scale 1 m. Blocks 9, 10, 85 are carved. P = pecked blocks. Items 215, 218, 219; flakes. 221: core; 217: large scraper; 220: core scraper.

Figure 7.41. GTVT. Stone cairn associated with carved block GTVT-10; the recorded pecked block is on west side (at right). Scale 100 mm.

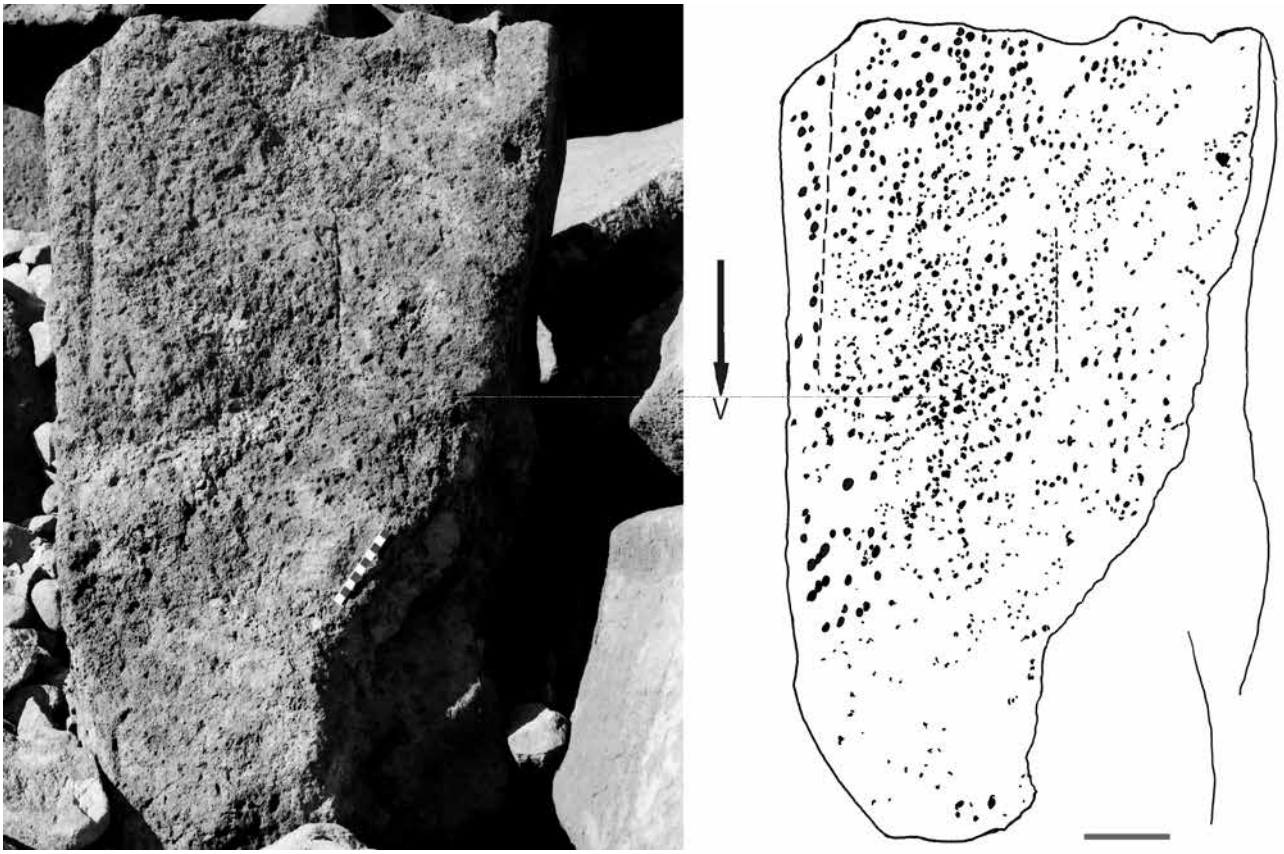


Figure 7.42. GTVT. Hammered block one half metre to the west of GTVT-10. Scale 100 mm.

1 Are the shell dates always reliable?
2 The LY-3609 determination estimates the date of the death of the mollusc. Would it be possible that an occupant of the area picked up a Pleistocene fossil shell from the beach, say only 2000 years ago, and then used it as a water container at the top of Gum Tree Valley?
3 What are the links between this old shell and the rock carvings?

Jacques Evin, then director of the radiocarbon dating laboratory of the University of Lyon, who emphasized the validity of the date, answered the first question (pers. comm. 15 December 1985: Chapter 7, Addendum A). The second question was answered by George Kendrick, palaeontologist, and Peter Bindon, archaeologist, of Western Australian Museum (pers. comm. 19 December 1985: Chapter 7, Addendum B).

Melo amphora and *Syrinx aruanus*, both used as containers, have been found at some inland sites. Their diffusion is, of course, more restricted than that of the shell pendants studied by John Mulvaney (1975: 111). Small ornaments could be transported more easily than large whole shells. But in July 1984, Peter Randolph and I saw pieces of a large Baler Shell at the foot of carved rocks of Egina granite at Woodstock, about 150 km from the sea. If the GTVT shell is of Pleistocene age, it was carried an even greater distance because the coast was further offshore then. Its presence at GTVT provides evidence of an exchange system or trade with coastal communities or the existence of some trips by inland people to the sea. Such relationship could have had a Pleistocene origin. The Woodstock finding provided us with a better understanding of the presence of a Pleistocene shell at the Top of Gum Tree Valley.

The third question is difficult to answer. One might think that the presence of the old shell indicates that Gum Tree Valley Top was inhabited about 22 000 years ago, but that the rocks were not yet carved. However, the Pleistocene *Syrinx aruanus* was in the centre of the site, and surrounded by deeply patinated carvings whose motifs and styles suggest that they belong to the Pleistocene age. Moreover, we have seen that the artefacts, most of which belong to the 'Australian Core Tool and Scraper Tradition' (Bowler *et al.*, 1970; Mulvaney, 1969, 1975), are linked to the old period of carvings. Therefore, it is unlikely that the *Syrinx aruanus* alone dates to that time. It must belong to the same assemblage as the old tools and petroglyphs. The problem here is almost the same as the one posed by the carbon dates using charcoal found on the floor of Koonalda cave (Wright, 1971) or Lascaux (Leroi-Gourhan & Allain, 1979). It is likely that the petroglyphs and surface remains are linked and are contemporaneous.

The Gum Tree Valley Top site is different from the rock art sites on the shore that are close to the middens. It is one of the oldest groups of carvings in the area. Some of its figures were carved probably twenty millennia ago.

Associations and groupings

We propose to ascertain whether the carvings at the top of Gum Tree Valley, considered together, form some ordered assemblage, and if certain motifs tend to be isolated, or to form groups and associations.

Although the concept of a 'panel' is sometimes imprecise when describing the continuous painted walls to be found in huge shelters and decorated caves, such panels are self-evident in the Dampier region where the figures are found on slabs of rock, or to be more exact, on block surfaces the areas of which are defined naturally, and which have surface areas of about 1–2 m^2.

We make a distinction between an 'internal association',

Table 7.19. GTVT. Intra-thematic associations of ancient carvings.

themes	number of panels with single theme repeated	proportion of single themes repeated (%)	mean number of repeated individuals per panel
'humans'	5	12.1	3.4
'tracks'	3	60.0	2.6
oval forms	1	10.0	2.0
punctations (dots)	1	4.3	5.0

which refers to the figures that form groups *within* the same panel, and an 'external association', referring to groups formed between figures *on different rocks and different panels*.[12] Of course, all the petroglyphs were not carved at the same time. The combinations to be studied will be taken from among the ancient carvings that exhibit a high degree of patination.

The rare superimpositions observed on the site are not distinguishable by any difference in shade, the time interval separating the different markings being too short or, simply, not long enough for any original contrast in patina to still be in existence today. In this case, one can suppose that superimpositions were probably meant to be part of intentional groupings; that is, associations. Even if we must admit that, today, the same patina can be found on two carvings, both many thousands of years old, but perhaps, nevertheless with an interval of a thousand years between them, we must not forget the continuing importance

Table 7.20. GTVT. Ancient carvings: comparison of frequency of occurrence of combined themes.

themes		total number of themes	number of associated themes		association index	mean number of repetitions per theme
			n	%		
'human'		37	13	35.1	1.5	1.7
'kangaroo'		8	3	37.5	1.0	1.1
'bird'		3	2	66.6	2.5	1.0
'snake'		2	1	50.0	1.0	1.0
'turtle'		3	2	66.6	1.0	1.3
'fish'		5	1	20.0	2.0	2.0
'kangaroo tracks'		5	1	20.0	2.0	2.8
'bird tracks'		5	2	40.0	1.0	1.2
'human' tracks	HT	5	2	40.0	1.5	1.0
circular forms		4	3	75.0	1.3	4.3
arc-like forms		6	5	83.3	1.6	1.8
bi-lobed forms		4	2	50.0	2.0	1.5
oval forms		10	6	60.0	1.3	1.2
linear forms		14	12	85.7	1.8	1.0
punctations (dots)		22	20	90.9	1.7	8.2

Table 7.21. GTVT. Relationships among the various themes.

		animals					prints			geometrics					
themes									HT						
'human'	8	2	1	—	1		1	—		1	2	1	—	4	9
'kangaroo'	2	1	—	—	—	—	—	—	—	—	1	—	—	—	—
'bird'	1	—	—	—	—	—	—	—	—	—	—	—	1	2	1
'snake'	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
'turtle'	1	—	—	—	1	—	—	—	—	—	—	—	—	1	1
'fish'	—	—	—	—	—	1	—	—	—	—	—	—	—	1	1
'kangaroo tracks'	1	—	—	—	—	—	4	—	—	—	—	—	—	—	1
'bird tracks'	—	—	—	—	—	—	—	1	—	—	—	—	2	—	—
'human tracks' (HT)	—	—	—	—	—	—	—	—	—	—	—	—	—	1	2
circular forms	1	—	—	—	—	—	—	—	—	2	1	—	—	—	2
arc-like forms	2	1	—	—	—	—	—	—	—	1	1	1	1	—	2
bi-lobed forms	1	—	—	—	—	—	—	—	—	—	1	1	—	1	1
oval forms	—	—	1	—	—	—	—	2	—	—	1	—	1	2	4
linear forms	4	—	2	1	1	—	1	—	1	—	—	1	2	—	7
punctations	9	—	1	1	1	1	1	—	2	2	2	1	4	7	—

of these carvings for successive generations as is shown by the frequency of renovation of the motifs. Even if they have been made over a long period, many such associations can still be culturally significant.

The carvings that we will ignore are the 'fresh' ones, which are, moreover, few, much more recent and obviously belonging to another tradition.

Internal associations

The average number of petroglyphs per panel is 4.1 (including the indeterminate ones), while the average number of different themes per panel is only 1.5. Nearly three-fifths of the panels (59.2%) have only one motif. One tenth (10.2%) have the same motif but it is repeated several times (intra-thematic associations), and three-tenths (30.6%) have several related themes on the same panel (inter-thematic associations).

Intra-thematic associations

Themes that are the only ones to be found on one panel, but which are repeated, are depictions of humans, kangaroo tracks, ovals and dots. The frequency of repetition is described in Table 7.19.

In fact, the repetition of 'human' figures often forms a visual narrative. Motifs GTVT-15 {p. 627} and -65 represent coital acts; GTVT-70 {p. 656} represents a scene of childbirth; and Motif 73 {p. 656} depicts a line of dancers holding hands.

The 'kangaroo tracks' are generally to be found in groups of two or four, positioned in realistic symmetry. There is only one recorded example of an isolated 'print'. It is in this respect that one can see the difference with 'bird tracks' that often stand alone but can be found repeated on several neighbouring rocks, to represent the path of the bird. They are, as one would expect, positioned in a line.

Repetition is, therefore, for the most part, the result of a sense of realism. The motifs no longer have individual value. They form part of an assemblage that itself has significant meaning.

Inter-thematic associations

Each theme was found to have a tendency either to isolation or to grouping (Table 7.20). Having been inspired by the Sauvets' (1979: 345) discussion of "The semiological function of animal rock-art in the Franco-Cantabrian region", I have retained their definition for an association index: "the average number of themes, found to combine with one given theme".

Geometrical forms (especially lines and dots), and to a lesser degree 'animals', are frequently associated with other themes, while 'tracks' and 'human' figures are, by contrast, more often isolated than associated with other themes. The association indexes for geometrical motifs are the most homogenous. These values are often greater than those of 'men', 'tracks' or 'animals' categories, although some of the rare themes like 'birds' or 'fish' have a high rating (given the small number of the latter, their indices probably are not very significant).

Furthermore, among the various depictions of prints, 'kangaroo tracks' have an Index value twice as large as that of the 'bird tracks'. The average number of individuals in association (per group) reveals that, within the groupings the punctations, the circles and generally all geometric forms are to be found in greater numbers, while the 'animal' motifs often stand alone. The number for 'human' figures falls somewhere between these two categories. To summarise, it appears that geometric forms show the greater tendency toward association and toward repetition within associations.

From the recordings of carvings from the Top of Gum Tree Valley, a symmetrical table can be constructed with 15 × 15 attributes corresponding to the number of different themes identified (Table 7.21). The intersection of line A with column B represents the number of times theme A has been found to be associated with theme B.

The dots or punctations have the greatest range; this category was found to associate with 12 different themes, and especially with the 'human' figures and linear forms. The table also confirms the strong tendency of the geometric forms to associate with other themes. The linear forms, for

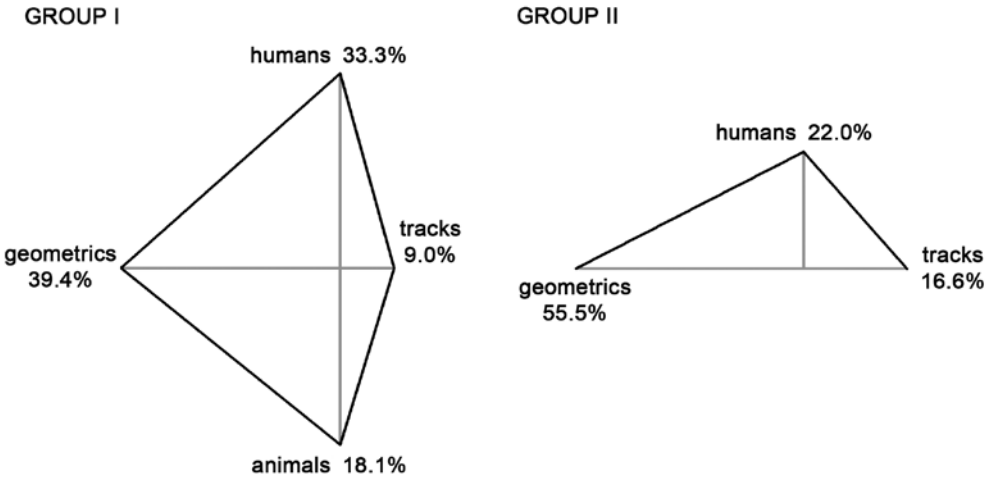


Figure 7.43. GTVT. Characteristics of motif clusters, Groups I and II ('deeply patinated'; without 'indeterminate' category).

example, accompany eight different themes, but they are found particularly frequently with punctations and 'human' figures. 'Human' figures are combined with ten different themes and clearly show a distinct preference for punctations and other 'human' figures. 'Animals' are, in contrast, rarely linked with other themes, and when they are, it is with 'human' figures, punctations or lines. 'Animal tracks' are more frequently associated with other 'tracks'.

External relationships

Through analysis of the distribution of carvings of different themes at GTVT several groupings have been revealed. The general chart indicating the clustering of petroglyphs shows a series of 'islands' where they are more concentrated in number (Figs 7.4 and 7.5). These groups are of different thematic composition. The two most concentrated areas (Groups I and II) of the most ancient ('deeply patinated') carvings provide us with two quite different diagrams (Fig. 7.43). Group II is richer in geometric forms and 'tracks' than Group I, but does not possess any 'animal' figures, unlike Group I where they are quite numerous.

This example shows the site to be composed of several different thematic clusterings. It is not possible, however, to follow this result with any comparison between different local groups using this method because the number of motifs to be found in each is too small.

Fortunately, the study of the distribution of different variables within the site gives us supplementary information that can be used to clarify the groupings of carvings. To make the job of comparison easier, charts showing equi-density, have been drawn up for each variable. These simplified charts, with nothing more than the greatest and least concentrations marked on them, have been constructed using the detailed charts that illustrate the preceding sections. In the following diagrams (Figs 7.44, 7.45), they are positioned one above the other in order that different areas of distribution can be compared at a glance.

Considering both the total area bound by the Density Curve I and the small areas of maximum concentration that form a series of nuclei within these areas, two main, different, collections can be identified:

1 a collection 250–280 m in length occupying the whole of the site from west to east. Its 'centre of gravity', in other words the most concentrated areas of clusterings, is in the western part of the site; as one comes from the west, it is to be found within the first 150 m. This collection includes depictions of 'ghost-like' figures, 'kangaroo', 'birds' and 'snakes'; certain geometric forms including ovals, arcs and bi-lobate motifs; highly-patinated carvings and figures made by large separated punctures in the rock; and
2 a second collection is to be found further to the east, in the last 100 m if one continues to travel in the same easterly direction. Here the centre of gravity is near the top of the valley near carved Panel 38 {p. 639} blocking the valley. The centre of gravity is therefore often to be found to the east of an imaginary vertical line (which I have traced on the chart). This second collection consists of figures of stick figures, 'fish' and 'turtles', punctations and patinated carvings.

Intaglio figures have a fairly central distribution and spread over the two clusterings. The few 'fresh' carvings (last row of Fig. 7.45) are dispersed almost over all the site, but with two small clusters to the west. Their distribution is therefore like that of the first clustering, which is much older. These observations are summarized by the diagram (Fig. 7.46).

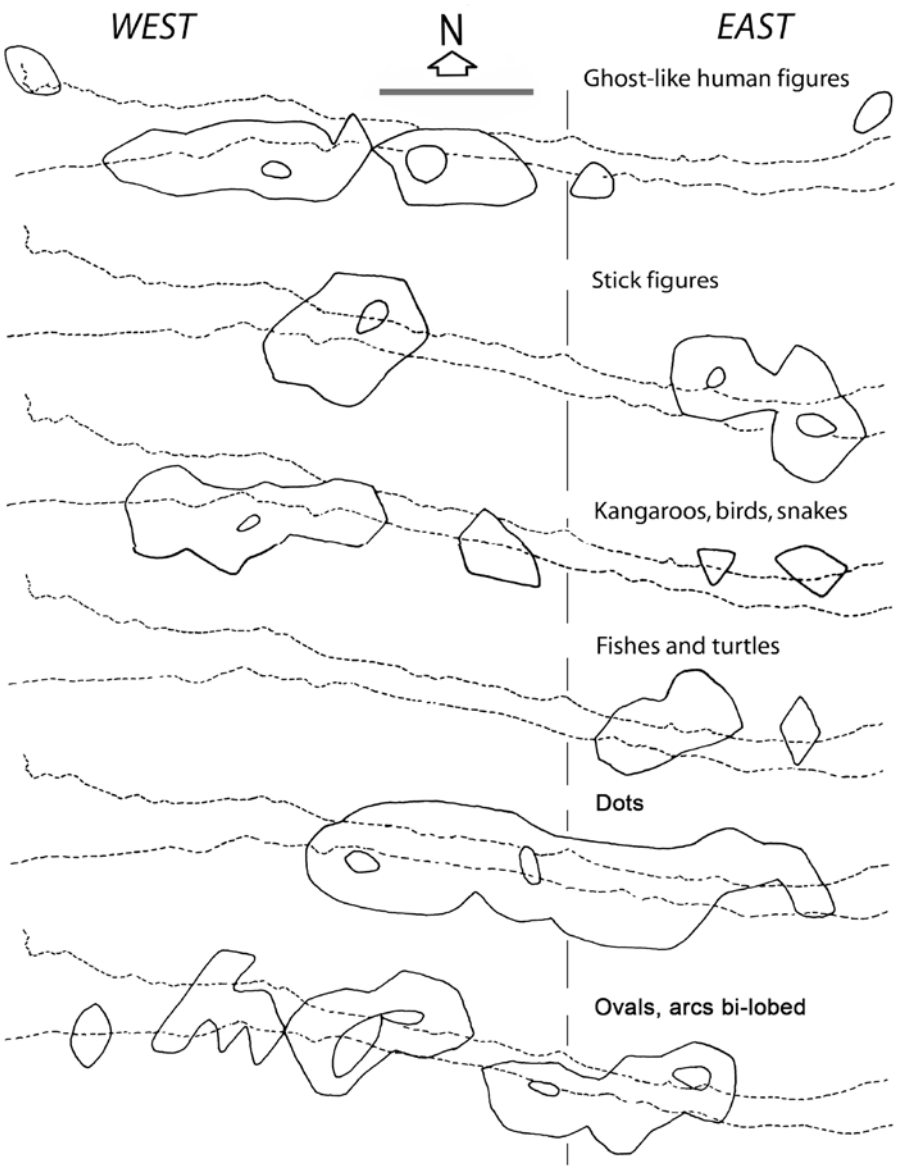


Figure 7.44. GTVT. Summary of distribution of various categories of motifs. Scale 50 m.

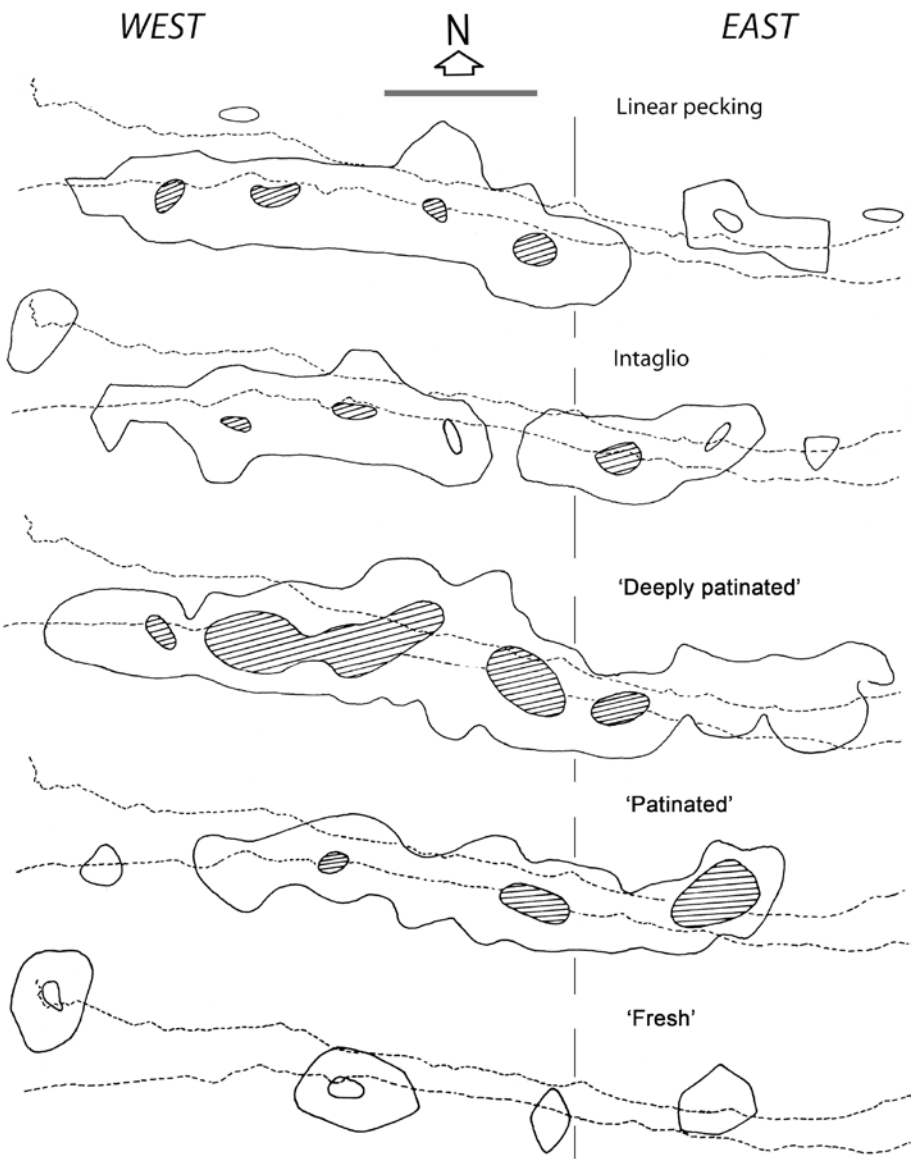


Figure 7.45. GTVT. Distributions of various variables studied. Scale 50 m.

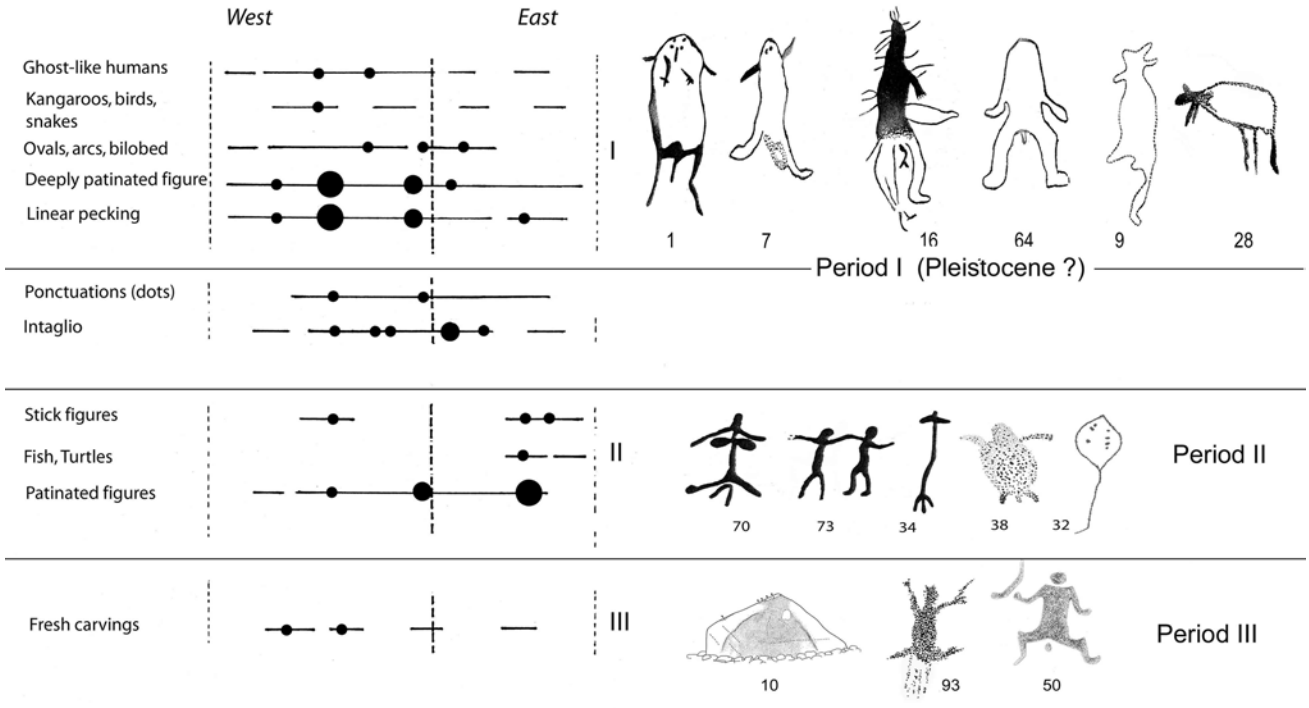


Figure 7.46. GTVT. Schematic topographical distribution of the studied characteristics of the petroglyphs.

The Top Group conclusions

The upper part of Gum Tree Valley constitutes a site independent of the other zones of the valley. As one walks to the Top Group from GTVE, there is an area with very few carvings. At GTVT, petroglyphs suddenly are visible again to the visitor; they are concentrated at the bottom of the slopes over a distance of 270 m.

- The Top Group comprises carvings of various ages, and, on the ground surface, stone tools, marine shells, stone-mound structures, and a small man-made cavity in the bottom of the thalweg that was almost certainly an old water-hole.
- Among the petroglyphs, 105 carved rock surfaces ('Panels') were recorded. These bore 418 carved motifs or 'graphic units'. Sixty percent of the motifs are geometric forms, including punctations, lines, circles, arcs, ovals and bi-lobate forms. The 'human' figures, which constitute nearly one fifth (17.7%) of the total number, are crude drawings, some stick figures, some ghost-like figures and various other forms. Depictions of 'animals' only account for 6% of the total; they are mainly 'kangaroo', 'bird' and 'snake' motifs; depictions of sea creatures ('turtles' and 'fish') make no more than a rare appearance. 'Animal tracks' (of 'kangaroo' and 'birds'), are not very common (4.7%).
- All these petroglyphs are found on gabbro blocks with surface areas of between 1 and 2 m^2. These blocks appear to have been chosen for their size and position—they are large and oriented towards the thalweg—as if they were generally meant to be seen by visitors walking through the valley. The most obvious figures are the depictions of 'ghost-like' humans. On the other hand, certain geometric motifs seem to be hidden away as if they were meant to be an unobtrusive form of representation.
- Most of the petroglyphs (70%) are delineated by a series of punctures in the rock surfaces. One fifth comprises silhouette forms with punctures all over the figure (intaglio). Finally, there are rare examples of different techniques: six petroglyphs were formed by hammering-pounding, and three by scraping.
- The small number of superimpositions (6%) and the abundance of isolated figures (54%) are basic characteristics of this group of petroglyphs, as is the rarity of figures that have been re-marked several times. Thanks to a new method of ascertaining the contrast between the actual motif and the surface on which it has been inscribed, an objective study of patination was attempted. Three-fifths of Gum Tree Valley Top petroglyphs could be described as 'deeply patinated' (contrast is non-existent or barely apparent), and 30% could be described as 'patinated' (the contrast measured between 0.05 and 0.14). Only one tenth was very distinct and can be considered as 'fresh' carvings. All my research of GTVT carvings confirms the chronological value of patination studies.
- The topographical distribution of these different degrees of patination has provided a greater understanding of the use of the site throughout thousands of years. Of the very ancient carvings, the most highly patinated ones occupy the western sector while the lesser patinated motifs are concentrated mainly in the eastern sector. This 'progression' over time of carvings towards the east, suggests that the earliest means of access to the site was at the western side, and not by the eastern pass, which is up a steep slope and overlooks the marshy expanse of Fenner Creek. If the latter was used as an access it would have been only rarely, as shown by the absence or near absence of carvings in the areas of the pass.
- Although GTVT could be classed as an independent site, it was evidently not completely isolated, but formed a part of the ensemble of petroglyphs of Gum Tree Valley forming a vast gallery with separate groups of works to be seen in succession as one moved from west to east following the bed of what was an occasionally flowing stream.
- The way in which the Top Group carvings are grouped together or are associated with other vestiges within the site has been studied. Certain motifs tend to repeat themselves or to associate with other categories of motifs, whereas others tend to isolation. The relationship between geometric and adjacent motifs, for example, seems to differ from that of the 'human' figures. The repeated use of precise technical details on what must be contemporary figures (because of their identical patina), allows us to identify motifs that were probably made by the same carver. Examples are the use of elongated punctures on eight separate motifs on the southern slope, and the group of seven 'stick-men' on the northern slope. The similarity of their styles and their grouping on neighbouring slabs makes them even more distinctive.
- The map of the distributions of all the variables, and charts showing curves of concentrations, facilitate comparisons of these variables and allow these observations to be made. It seems that the artefacts, numbering 360 (mainly flakes, cores and scrapers), which indicate brief stays on the site, relate to the carvings, especially those 'deeply patinated' and 'patinated' (as shown by the similarity of their distributions). The few *Anadara granosa* shells, on the other hand, reveal sporadic and infrequent visits to the site, and no strong relationship can be ascertained between them and the petroglyphs.

Toward a history of the site

Certain motifs, certain techniques and degrees of patination tend to group together. By examining the distributions and their respective differences, and by looking collectively at all the observations made during the study of GTVT, it is possible to reconstruct a history of the site.

Ancient period

The oldest period is characterized by the widespread distribution of petroglyphs across the whole site, with a special concentration in the western sector; by production in the form of intaglio or linear punctures of depictions of large 'ghost-like' human figures, kangaroo, snakes and birds, geometric forms (circles, arcs, ovals, bi-lobate forms), all of which are today highly patinated. Repeated visits to the site are also indicated by the presence of artefacts. By their typology and the absence of microliths, these could belong to the period of the 'Australian core tool and scraper tradition'.

This phase has a Pleistocene origin. The fragments of a large *Syrinx aruanus* near a soak in the bottom of the valley that were dated to more than 20 millennia ago testify that the site was frequented by persons during the Pleistocene period when the sea was 130 km to the west of the present coastline. The large *Syrinx aruanus* was carried to the area of GTVT and probably used to carry potable water. At this time, Gum Tree Valley was an inland site. However, this shell clearly shows that there were already some occasional links with the sea by trade with coastal peoples or perhaps the Gum Tree Valley occupants made trips to the coast.

From the beginning of this period, the appearance among the carvings of the first few depictions of fish or turtles would not be surprising. One can see today in inland carvings sites some depictions of turtles and even of boats, at distances from the sea of more than 50 km; as with the presence of the large marine molluscs (*Melo amphora* and *Syrinx aruanus*) sometimes found in such sites, these images neither imply continuous strong links with the sea nor suggest proximity to the shore. But occasional links were possible.

Middle period

The Middle Period is characterized by the elaboration of figures with a basic patina that still permits a certain definition on the rock surface. During this time, there was an even greater concentration of carvings in the east of GTVT. Previous carvings appear to have been respected and new ones were made to the east of those already existing. Depictions of humans, especially in stick-figure form, now also feature, along with those of fish, turtles and punctations. In general, all the motifs are fully-pecked (intaglio). From this development two important points arise:

1. a respect for pre-existing pictures; persistence of certain themes and techniques; progressive movement of the greatest areas of occupation towards the east. All these points emphasize a chronological continuity between the Ancient Period and the Middle Period; and
2. the inclusion of a small number of 'turtles' and 'fish' among the carvings deserves some attention. It has been noted that the depictions of these marine creatures have reached different stages of patination and were therefore made at different times. They represent a small proportion of the total number of motifs of GTVT. As in the previous period, there is no evidence of the close proximity of the sea. It is clear anyway, that the 'fish', 'turtles' and well-defined ('fresh') carvings are a rarity on this site, whereas they are found to dominate on the seashore today around the shell middens.

Recent period

The final period is characterized by the elaboration of about 12 motifs ('human' figures) still clearly defined on the rock surface. The differences in patination, style and technique used for these motifs (and the appearance of the hammering-pounding technique) show a lack of continuity between the Middle Period and the Recent Period. There has been, in fact, a definite break between the two.

For a long time after the Middle Period nobody visited Gum Tree Valley Top. It is likely that the stone-mounds were constructed during the Recent Period because the carving that is most distinct (GTVT-10 {p. 623}) is associated with the most obvious of the stone-mounds. During this period, visits to the site seem to have been few. Carving as a practice seems to have diminished in importance, and the very purpose of the site could have changed, as the appearance of these curious mounds seems to indicate.

Although the lithic tools seem old, it is quite possible that some of them also date from this period, but we cannot be certain. In the same way, it is tempting to attribute the *Anadara* shells to this most recent period, and they reveal the indisputable proximity of the sea (as opposed to the *Syrinx aruanus*, the water carrier, which had to be brought a considerable distance to the site).

Chapter 7—Addendum A

Discussion of the Top Group radiocarbon analyses

The following is a personal communication from
Jacques Evin to Michel Lorblanchet
dated 15 December 1985.

Introduction

Six radiocarbon analyses on marine shells gathered by Michel Lorblanchet from several sites at Gum Tree Valley were carried out by the radiocarbon dating Laboratory of Lyon University. It is necessary to explain in detail from a physicist's point of view the bearing these results will have, taking into account the carbonate material used. A description of Laboratory operations which have provided the dates and the way the raw data were corrected are essential for a perfect understanding of these results.

The inherent limitations of marine carbonate when subjected to radiocarbon dating

Especially for archaeological purposes it is usually best to carry out radiocarbon dating on charcoal or on collagen found in fossilized bones. These materials are very often guaranteed to provide us with all the information we could possibly want with regard to their origin.

When these preferable materials are absent as is the case of Gum Tree Valley one must contemplate having to turn to the shells as a subject for analysis. With this dating material, we cannot expect the usual accuracy for two reasons and thus we must sometimes make careful use of the information collected.

The uncertainty about the original content in radiocarbon

One knows that the dating method relies on the principle that one can guarantee the validity of a date only if the original percentage of carbon-14 in the carbonate matter is unequivocally equal to that of the atmosphere when such matter was created. This condition is easily respected for the organic matter formed on continents in the open air, but it is certainly questionable for the carbonate formed in continental freshwater and less than reliable for the carbonates formed in saltwater. The carbonate that forms the carbonate ion of calcium carbonate found in the shell of sea creatures can only come from the bicarbonate dissolved in seawater. An isotopic equilibrium between this and that of atmospheric carbon dioxide does not always exist, for example if the water is confined or if the seawater is influenced by continental freshwater.

It was often noted that actual living sea creatures have a radiocarbon content 5% less than that of the atmosphere which when interpreted in terms of age is 400 years.

But it is certain that the isotopic splitting up which occurs during the shell formation on the animal metabolism enriches the organism of radiocarbon by 5%, thus rejuvenating it by about 400 years also. Both effects are counterbalanced and, most of the time, the carbon dates from the shells can be considered as close to the accuracy of those obtained from the preferred materials.

However, if the isotopic splitting up can be accurately measured in the Laboratory by the analysis of 13C, the 14C impoverishment of the sea is related to palaeogeographic conditions so that it is impossible to be certain about fossil shells.

In conclusion to this point, one must emphasize that one should have for this reason a margin of uncertainty of about 400+ years.

The uncertainty of shell preservation: the pollutions

To obtain a valuable date it is necessary to be sure that the carbon whose radioactivity is measured is indeed that which was originally in the carbonate material itself. The necessary purification to verify the fulfilment of such a condition is easy for bones and charcoal. In particular, all the secondary carbonates which can impregnate them are eliminated by strong acid which is applied continuously until all effervescence stops. Such a treatment is of course impossible with shells as they would be totally destroyed. One is restricted to a simple washing with diluted acid which dissolves only the superficial layer of the shells and leaves the inner part intact. One must therefore suppose that there was no deep secondary carbonate penetration. This is often true when the shells are compact, but this remains an hypothesis. There is no means of detecting the eventual pollution which can make the date older or younger. The only valuable solution would be to practice analysis only on shells with a thick coating of mother-of-pearl.

Pre-treatments and treatments carried out by Lyon Radiocarbon dating Laboratory

The Lyon carbon dating laboratory uses the same general treatments as most laboratories which do a lot of dating. For the shells, the usual method of preparation consists in eliminating 30% of the superficial material by a brief dipping of the shell fragments in pure hydrochloric acid. All the Gum Tree Valley shell samples had a weight greater than 100 g. They were stripped down to a bare minimum of 40 g. It is probable that all the secondary outer concretions were eliminated so that any previous uncertainties need not be taken into account.

Then the samples were treated by acetylene, then by benzene. Finally, 2.64 g of this carbonate mixture were introduced into the scintillation detectors. Three days of counting were carried out for all samples allowing a usual statistic accuracy of 2–3%, which is sufficient for this type of material. The international conventions were of course respected when defining the results: laboratory counting number, statistic margin of counting and standard deviation, reference year AD 1950 as zero BP year.

The correction of dates

One knows that the radiocarbon ages are sometimes different from the real ages and that to pass from one to the other, one has to use correction tables which are referred to as dendrochronological corrections. This table can be used for dates no greater than 7200 BC. Following the same rules as applied at the other French laboratories we used the Klein *et al.* tables, and we expressed the corrected ages by 'years before or years after' Jesus Christ rejecting thus the terms BC/AD which we propose to keep for non-corrected dates only.

For the five dates, the intervals defined by the correction, that is the two dates within which the age of the shell could fall, are greater than the original intervals before the dates are corrected using the tables. This is quite normal since we must take into account a margin of error for the correction itself.

One recognizes then that these intervals in terms of real years are not useful; they are given to exclude any contemporaneity.

Conclusion for the six dates

The Holocene dates must be separated from the Pleistocene ones.

For the five Holocene dates, the relative accuracy is not very good: 100–150 years on 2000–3000 years; but the time interval that they define has a good chance of being correct, because when concerning ourselves with the first of those problem conditions that we cannot take for granted, we see that, in fact, the natural environment of the shellfishes was probably well aerated and not influenced by continental fresh water. The radiocarbon content was probably very close to that of the atmosphere. Moreover, the uncertainty about the secondary pollution is also a much lesser extent thanks to the dissolving process that one has subject them to before extracting the carbon whose radioactivity was measured. One can consider that all the five dates are quite reliable.

The oldest date: LY-3609: The first uncertainty is quite negligible because, even in the case where the statistical margin would be doubled, it would be of no consequence to the archaeological interpretation of this result.

On the other hand, some recent carbon pollution is possible. The older the sample, the greater the influence of the pollution. The result would be to give a date younger that the correct one. In fact, it would be unlikely that such a pollution could stand up to the treatment carried out for out of the 134 grams of the available sample, only 40 g were kept for measuring purposes. This elimination of three quarters of the material serves as guarantee against the possibility of pollution. One can say that the risk of deviation from the accuracy of the age gauged from the contemporary bones or charcoal is very little.

Therefore, the analysis of these shells, despite their bad reputation as a subject for such analysis which is in principle justifiable, has in the case of the Gum Tree Valley samples been able to provide us with quite reliable results if we take into account the margins of error indicated. With these conditions, these results can be used in the archaeological interpretation of the site.

J. Evin
Director of Radiocarbon dating Laboratory of
Lyon University

Chapter 7—Addendum B

Discussion of the dated *Syrinx aruanus*

The following is a personal communication
from Dr George Kendrick, Department of Palaeontology, Western Australian Museum,
to Dr Michel Lorblanchet, Centre de Préhistoire du Pech Merle, 46330 Cabrerets, Lot, France,
dated 19 December 1985.

Dear Michel,

Thank you for your interesting letter of 6th December 1985. I am pleased to see that your studies on the Skew Valley material are nearing finality and contain more than just a 'simple' story of Late Holocene occupation. [Dr Kendrick had identified the shells from my SKV excavations and he confused the source of this *Syrinx aruanus*.]

A check on the bathymetry, together with what is known of the generalized glacio-eustatic sea level curve, shows that at about 18,500 yr BP the shoreline lay close to its maximal regressive position, about 120 m below modern levels and about 130 km offshore from Dampier. Being a relatively shallow water species, we may assume that the 18,500 yr old *Syrinx* was collected near the shoreline at that time and brought to Skew Valley, either whole or in pieces, at one or several times, subsequently.

Sources for the above are, (i) Jones, H. A. 1973, Marine geology of the northwest Australian continental shelf, Australian Bureau of Mineral Resources, Geology and Geophysics Bulletin 136, Canberra. Australian Government Publishing Service (for bathymetry); and (ii) Shackleton, N. J. and Opdyke, N. D. 1973, Quaternary Research 3: 39–55 (for sea level curve).

Ethnographic data … suggest that in the recent past, the use of *Syrinx* and *Melo* shells as water carriers in the Pilbara region was restricted mainly to within about 100 km from the coast. However, pieces of these large shells were circulated and used over a much wider tract of country, lying at greater distances inland. So that pieces of broken shells could have been transported to Skew Valley at any time over the past 18,500 years to be used as scrapers, chisels or perhaps for other purposes.

It seems unlikely to me that a shell, even one as large as a Syrinx would survive intact on the surface for 16–18,000 years or so and still be in serviceable condition as a water carrier. If lying on the surface, it would have disintegrated long before this. If buried, however, it could have survived intact, but if the enclosing sediment were calcareous, then I expect some degree of cementation would have occurred over that time.

The simplest explanation I can see from reading your letter is that the shell was brought to Skew Valley at or around 18,500 yr BP, either whole or fragmented, where it has been lying around ever since. The Flandrian transgression got under way soon after 18,500 yr BP and all shore deposits from that time were either submerged, reworked or dispersed by the advancing sea. The specimen in question is the only known example (to me) of a shell from this regressive maximum, and was evidently rescued from oblivion by some fortuitous act(s) of transportation to an 'inland' site. Apparently Skew Valley was an occupation site at a time or times when sea level was much lower than present, and it seems reasonable to speculate that the older carvings and this older shell may in some way be associated.

To answer your question directly, I think that a Pleistocene *Syrinx* shell could well have been used by a Pleistocene Aboriginal person when the shoreline stood over 100 km seaward from its present position—yes. But such a shell could not possibly have been reworked, onto a 2000 year old beach by any natural means. Only human intervention could have brought it to the Skew Valley area (by which I would include the modern beach environment). The simplest explanation would be that this intervention occurred when the shell was more or less fresh.

If the shell were a Late Pleistocene—Last Interglacial specimen, it would almost certainly be enclosed in lithified calcareous sediment and unusable as a water carrier. However, broken pieces from such a fossil would perhaps be usable as scrapers, chisels, etc. The radiocarbon age, which is a finite one (that is not 'greater than') seems to rule out such a possibility.

I think I have answered your questions as best as I can, but if you have any further areas of uncertainty, do not hesitate to write again.

Yours sincerely, [signed] G.W. Kendrick

Department of Palaeontology, Western Australian Museum

Chapter 7—Addendum C

'The Village' at Gum Tree Valley Top

At 70 m from the western entrance to the Top of Gum Tree Valley, just before the narrowing of the thalweg which makes up the lower part of GTVT, a corridor between the blocks of the southern side provides quick access to the 'broken plateau'—a chaos of scattered blocks—that dominates the valley to the south (Figs 7.47, 7.48).

Cultural formations

This corridor is an opening within the mass of gabbro; it exploits a north-south divide perpendicular to the valley. About 50 m along this corridor is a kind of terrace. Here there is a series of 'islets' of greenery surrounded by rings of stones. These formations, almost identical to those already described at GTVK, are gaps formed by erosion developing from a network of faults. The main fault is oriented north-south, and they are cut by minor faults running in a north-east to south-west direction.

We mapped seventeen such islets in this area. Three show superficial signs of occupation, a few flakes of stone and a few *Anadara granosa* shells littering their surfaces. It is possible that several others were occupied, but the spinifex that clutters their surface conceals any further evidence (Fig. 7.48). Excavations would be necessary to test this possibility.

The few remnants observed are sufficient to confirm that these natural formations were modified and used by humans as platforms. They are surrounded by walls, or at least, a ring of stones. I interpret them as hut sites, like those identified at the Kangaroo Group, GTVK.[13]

Petroglyphs

Petroglyphs are very rare here. Around these shelters, in the northern part of the site, only four examples were found:

1 depiction of a kangaroo (600 × 450 mm) in linear pecking with separated points. The depicted animal, a 'male', is shown as injured in the 'chest' by a 'spear'. Also on the 'chest' is a big punctation which could also be a sign of an 'injury' (Fig. 7.49);
2 depiction of a turtle (250 × 185 mm). Made with linear pecking with separated points. The 'turtle' appears to have an extra 'leg'. Its 'body' is filled with punctations like those at GTVW. These probably are depictions of eggs. The turtle symbolizes the spawning migration (Fig. 7.50);
3 probably another 'kangaroo', a poorly preserved carving (550 × 380 mm); and
4 depiction of an Emu. Positioned vertically, its head is toward the bottom (540 × 320 mm). It was carved using linear pecking. Its actual position on a sub-vertical slab (1300 × 1100 mm) could be due to the overturning of an earlier horizontal slab.[14] This deep carving, also deeply patinated, is partly covered by a brown crust with glints of blue which is probably very old; it is partially exfoliated (Fig. 7.51).

Petroglyphs 1, 2 and 3 are all 'deeply patinated' and located on the tops of the blocks. The fourth, 'The Emu', is set in the lower slope—a plateau—of Gum Tree Valley; it could belong either to GTVT (the area of the entry to the site) or at the site I call 'The Village'. The stony surface of the panel is covered by brown crust, itself overlain by a grey crust; both have exfoliated revealing the lighter interior of the gabbro. A similar phenomenon is visible on the block with the depiction of the turtle. It seems that the Emu motif may be overlain locally by the grey crust. If correct, this provides a possibility of dating the grey crust and consequently the underlying carving using the Uranium-Thorium method that recently has been applied to the dating of Spanish Palaeolithic paintings (Pike *et al.,* 2012a,b).[15]

Two more carved panels were recorded on the plateau to the south of Gum Tree valley between GTVE and GTVT (in this area the carvings are rare): a depiction of an emu sitting on its eggs (Fig. 7.52), and of a large coiled snake on the upper surface of a block; both are deeply patinated (Fig. 7.53).

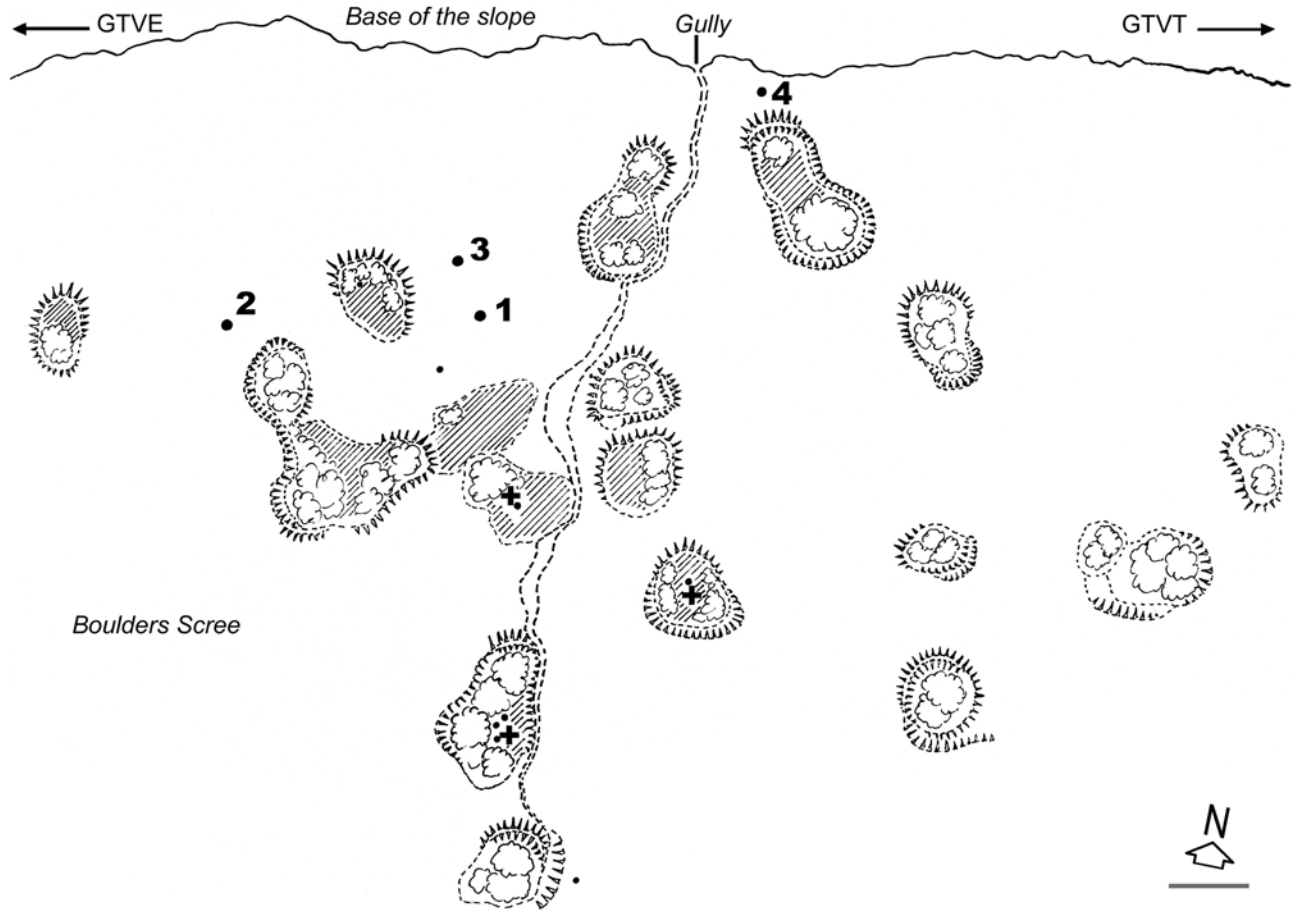


Figure 7.47. GTVT-V. Map of Gum Tree Valley Top 'Village'. Scale 10 m. Key: + = *Anadara granosa* shells; ● = artefact; 1 = 'kangaroo' motif; 2 = 'turtle'; 3 = indeterminate; 4 = 'Emu'.

Figure 7.48. GTVT-V. General view showing islets of vegetation among the block slopes.

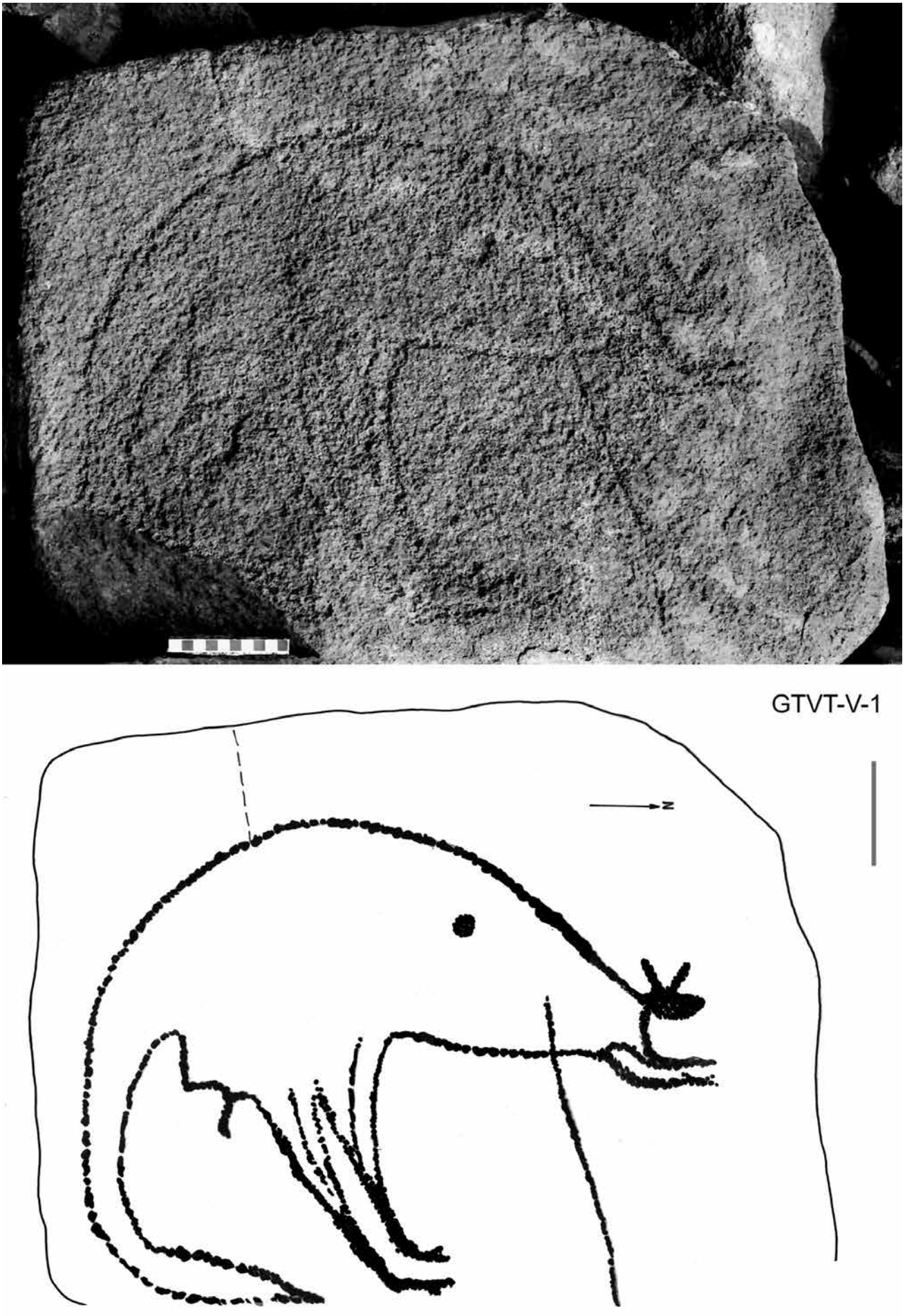


Figure 7.49. GTVT-V. Depiction of a kangaroo. *Upper:* photograph. *Lower:* tracing. Scales: 100 mm.

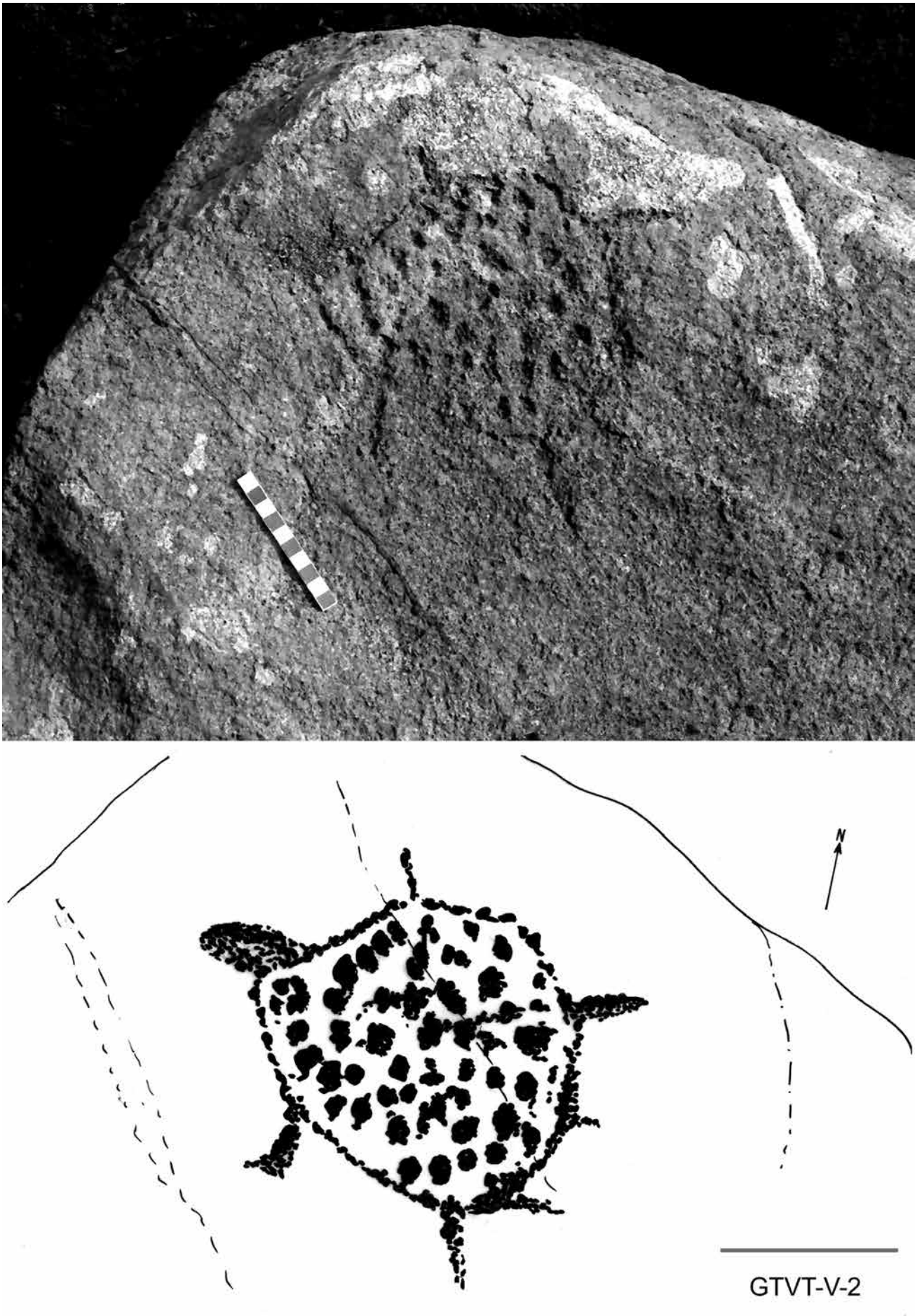


Figure 7.50. GTVT-V. Depiction of turtle with eggs (note exfoliated surface). *Upper:* photograph. *Lower:* tracing. Scales: 100 mm.

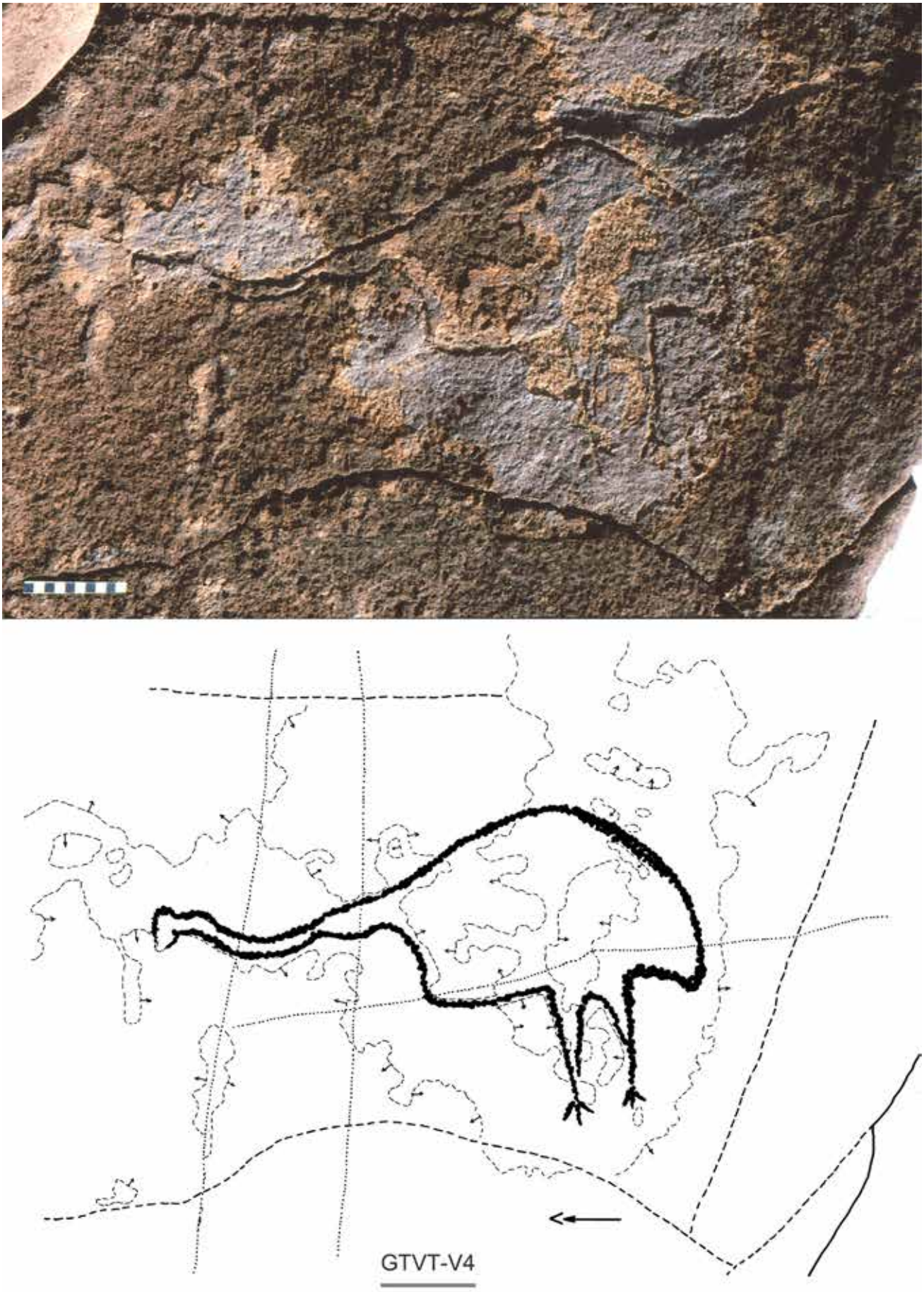


Figure 7.51. GTVT-V. Depiction of an Emu. Surface of rock is covered with a brown/grey crust, and shows exfoliation. Arrow indicates that image rests vertically. Left: photograph. Right: tracing. Scales: 100 mm.

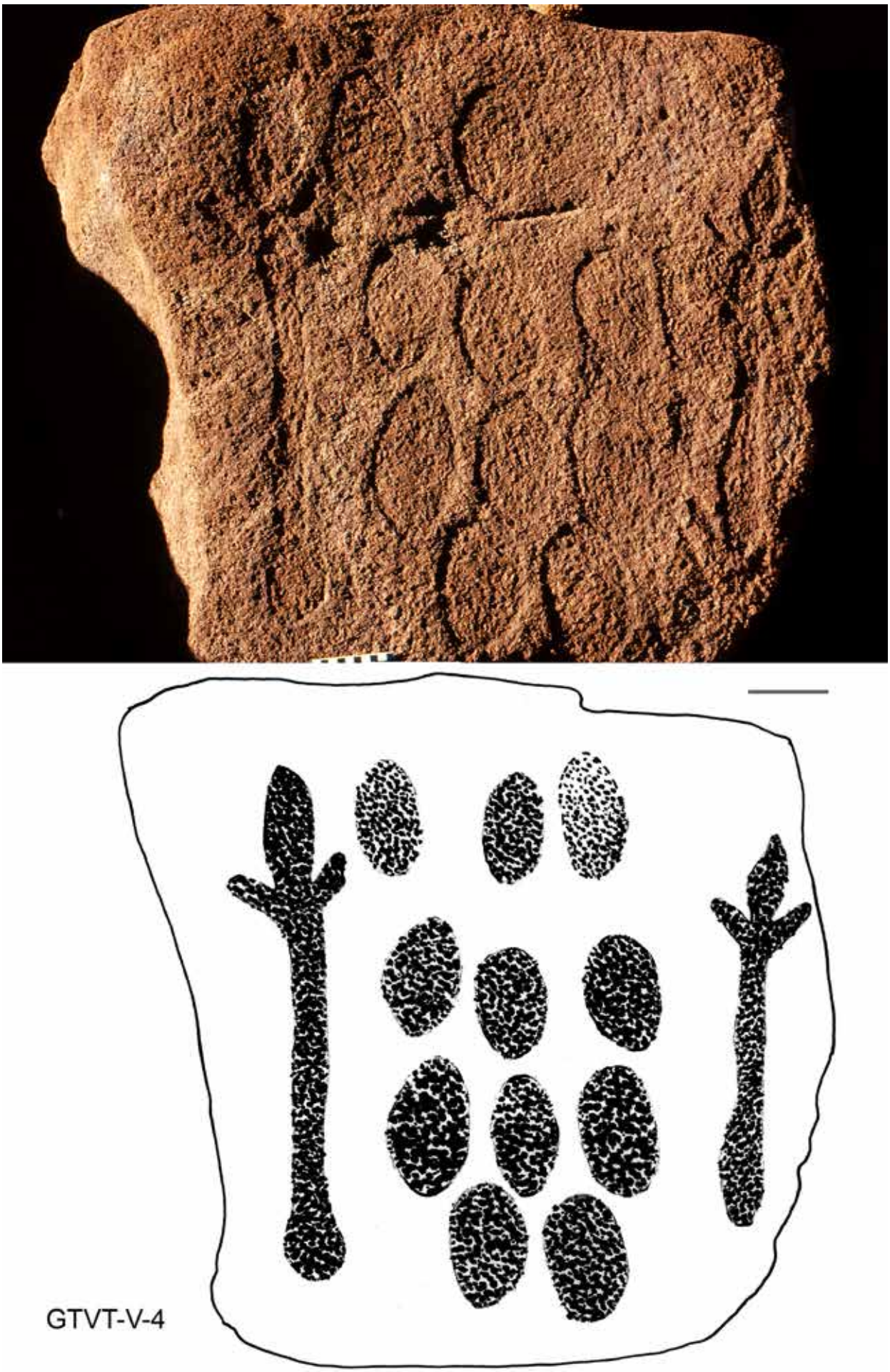


Figure 7.52. GTVT-Plateau. Depiction of an Emu sitting on its eggs. *Upper:* photograph. *Lower:* tracing. Scales: 100 mm.

Figure 7.53. GTVT-V. Depiction of a large coiled snake. Scale: 100 mm.

References

Bowler, James M., Rhys Jones, Harry Allen, and Alan G. Thorne. 1970. Pleistocene human remains from Australia: a living site and human cremation from Lake Mungo, western New South Wales. *World Archaeology* 2: 39–60.
https://doi.org/10.1080/00438243.1970.9979463

Jekhowsky, B. de. 1964. Diagrammes de dispersion des courbes de densité en biométrie [Scatterplots density curves in biometrics]. *Revue de l'Institut Français du Pétrole* 19(7–8): 841–844.

Leroi-Gourhan, Arlette, and Jacques Allain. 1979. *Lascaux Inconnu*. Editions de Centre national de la recherche Scientifique, Paris.

Mulvaney, D. John. 1969. *The Prehistory of Australia*. London: Thames and Hudson.

Mulvaney, D. John. 1975. *The Prehistory of Australia* (revised edition). Ringwood, Australia: Penguin.

Pike, Alistair W. G., Dirk L. Hoffmann, Marcos García-Diez, Paul B. Pettitt, Javier Alcolea, Rodrigo De Balbín, César González-Sainz, Carmen de las Heras, José Antonio Lasheras, Ramón Montes, and Joao Zilhão. 2012a. U-series dating of paleolithic art in 11 caves in Spain. *Science* 336 (6087): 1409–1413.
https://doi.org/10.1126/science.1219957

Pike, Alistair W. G., Dirk L. Hoffmann, Marcos García-Diez, Paul B. Pettitt, Javier Alcolea, Rodrigo De Balbín, César González-Sainz, Carmen de las Heras, José Antonio Lasheras, Ramón Montes, and Joao Zilhão. 2012b. Uranium Series dating revealing Iberian Paintings are Europe's oldest cave art. *Science Daily* 14 June 2012. [Accessed 14 November 2012]
https://www.sciencedaily.com/releases/2012/06/120614142840.htm

Sauvet, Georges, and Suzanne Sauvet. 1979 Fonction sémiologique de l'art pariétal animalier franco-cantabrique [The semiological function of animal rock art in the Franco-Cantabrian region]. *Bulletin de la Société préhistorique française* 76: 340–354.
https://doi.org/10.3406/bspf.1979.5161

Tindale, Norman B. 1962. Geographical knowledge of the Kaiadilt people of Bentinck Island, Queensland. *Records of the South Australian Museum* 14:259–296

Wright, Richard V. S. 1971. *Archaeology of the Gallus site, Koonalda cave*. Canberra: Australian Institute of Aboriginal Studies.

Endnotes

1 An initial translation of his report on the Top Group was made for Lorblanchet in the 1980s by a person employed by Lorblanchet for the purpose; Lorblanchet was not satisfied with the result, and Peter Randolph, then of the Department of Aboriginal Sites, Western Australian Museum, Perth, made extensive corrections. We are pleased to acknowledge that this unpublished typescript provided the basis for this chapter, edited and slightly expanded, and referenced to the original French language report—Editors.

2 Examples of various motifs are included in the text figures. Illustrations of many carved panels and petroglyphs prefixed 'GTVT-' are provided in the Appendix following this Chapter. Some motifs—identified, numbered, studied, traced in detail, photographed, located on maps, and sometimes included in computations reported in Lorblanchet's study—are neither included in text figures nor in the illustrative appendices accompanying each chapter due to the large number of petroglyphs at each site—Editors.

3 As in other chapters, a motif may be illustrated in an accompanying text figure (e.g., Fig. 7.8 item 1), and/or in the appendix following the relevant chapter (e.g., GTVT-1) arranged more-or-less in serial number order. Repetition of the motif numbers serves to remind the reader that a higher-resolution image is available in the Appendix accompanying the chapter—Editors.

4 Use of the term 'stick figures' is defined in Chapter 2, Part I: *Depictions of humans / Types of 'human' motif*—Editors.

5 Qualification of use of the term 'human prints': *(a)* These are not 'hand prints' comparable to the ubiquitous pictograms found throughout Australia (and widespread throughout the world) that are produce by blowing pigment across a hand (also done with other items such as a boomerang), or made by pressing a hand wet with pigment onto a shelter or cave wall. *(b)* Rather, in the context of this discussion of Dampier petroglyphs, 'human hand print' and 'human foot print' are shorthand terms for representations of the hand/s or foot/feet of a 'human'. *(c)* Since they are most often the depiction of part of the integral anatomy of a being, they are qualitatively different from the 'animal prints' discussed subsequently in each chapter, the 'kangaroo track', 'bird print' and 'turtle track', which represent simply the 'footprint' left in the soft ground by a passing animal—Editors.

6 Details of characteristics and habitats of putative identifications of genera and species may be sought in the annals of the *Australian Faunal Directory* (ABRS, 2009)—Editors.

7 The range and specific characteristics of carving techniques are discussed also in Chapter 4 GTVE—Editors.

8 Re-marking (renovation) is discussed in detail in Chapter 3 GTVS, extensively in Chapter 4 GTVE, and again with use of the 'contour gauge' in Chapter 5 GTVK—Editors.

9 Another was identified subsequently, as discussed in section below: 'Re-marking of carvings'

10 About Gossen 'Mastersix' and 'Profi-flex' there is a further note in Chapter 1; use of the photoelectric cell to quantify petroglyph patination states is discussed in Chapter 2 SKV, and most fully in Chapter 5: *Carving techniques and patination observed at the Kangaroo Group*—Editors.

11 Australian tool 'traditions' are discussed in detail in Chapter 2, Part II—Editors.

12 The definitions and methodology of internal- and external- relationship analyses are discussed also in Chapter 6: *Distributions and associations of various motifs*—Editors.

13 There is some discussion of 'huts' at Chapter 4: *The Eagle Group Site*, and especially at Chapter 5: *Living site floors*—Editors.

14 The terms 'sub-horizontal' and 'sub-vertical' designate rock surfaces that are approximately horizontal or vertical with respect to their position in the landscape—Editors.

15 Pike and his colleagues applied the uranium-series disequilibrium dating technique to calcite deposits overlying or underlying Palaeolithic cave paintings at 11 cave sites including Altamira, El Castillo, and Tito Bustillo (Spain); their minimum-age results demonstrate that the practice of decorating cave walls extends back at least to the Early Aurignacian period, with 40.8 thousand years (ka) indicating the age of a red disk, 37.3 ka for a hand stencil, and 35.6 ka for a claviform-shaped symbol, indicating that cave art was a part of the cultural repertoire of either the first anatomically modern humans in Europe or of Neanderthals.

Chapter 7—Appendix

Recordings of the petroglyphs of the Gum Tree Valley Summit (GTVT)

To define the orientation of each figure, on each recording are indicated: *(a)* the north orientation when it is a horizontal panel on top of a slab, and *(b)* the vertical orientation (an arrow with a 'V') when the surface is close to the vertical. Unless otherwise indicated, all scales represent 10 mm.

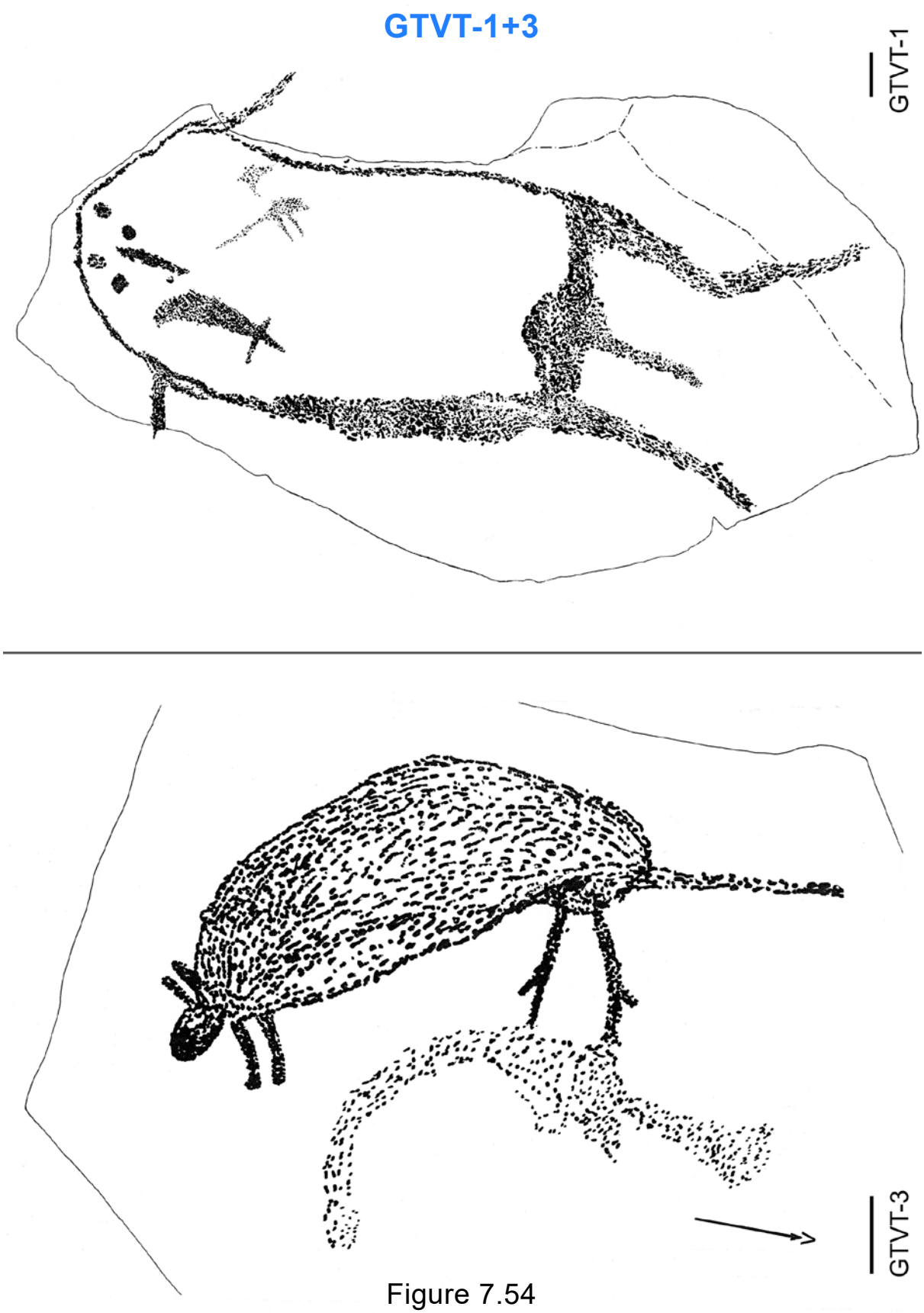


Figure 7.54

GTVT-4+detail

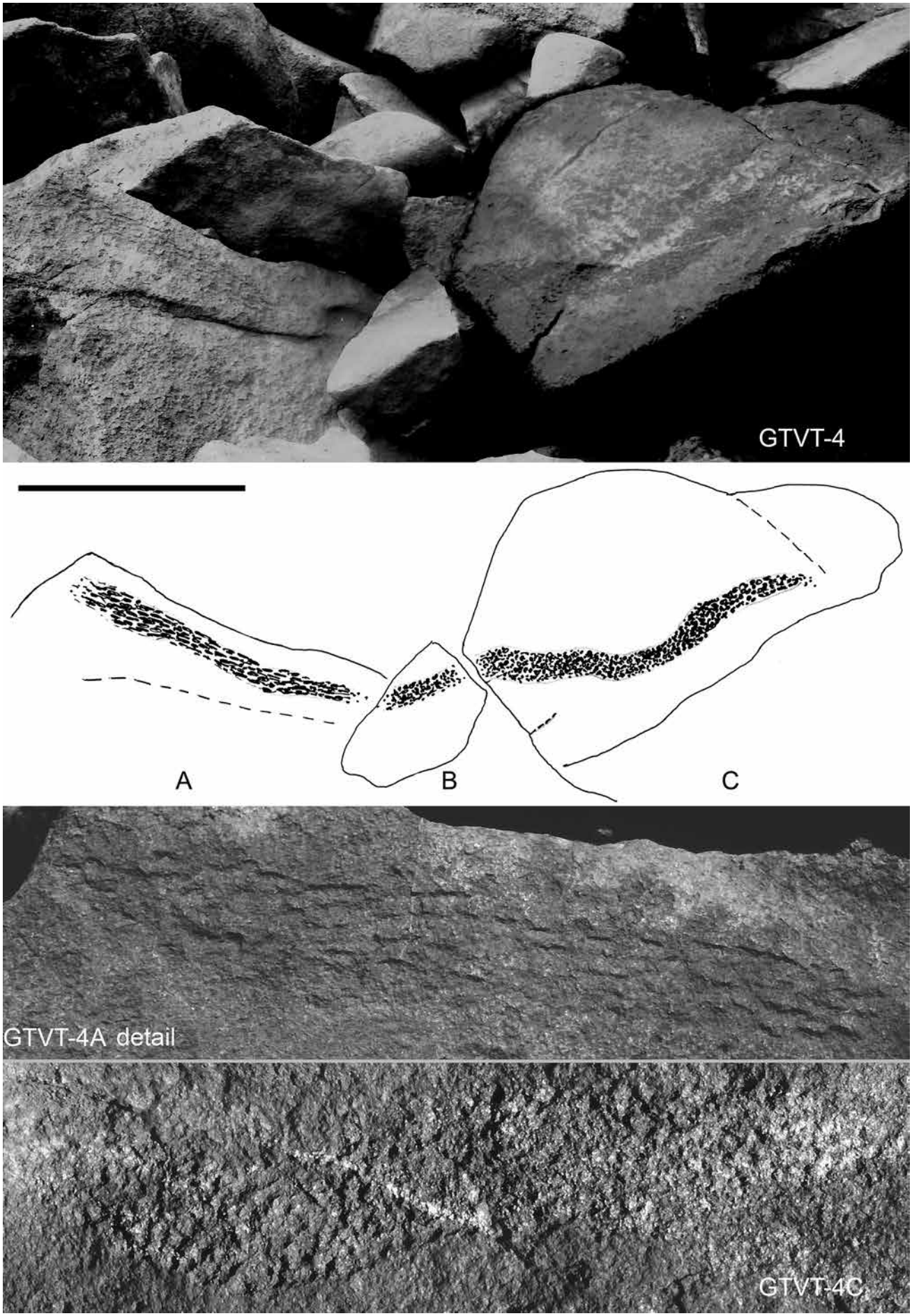


Figure 7.55

GTVT-6

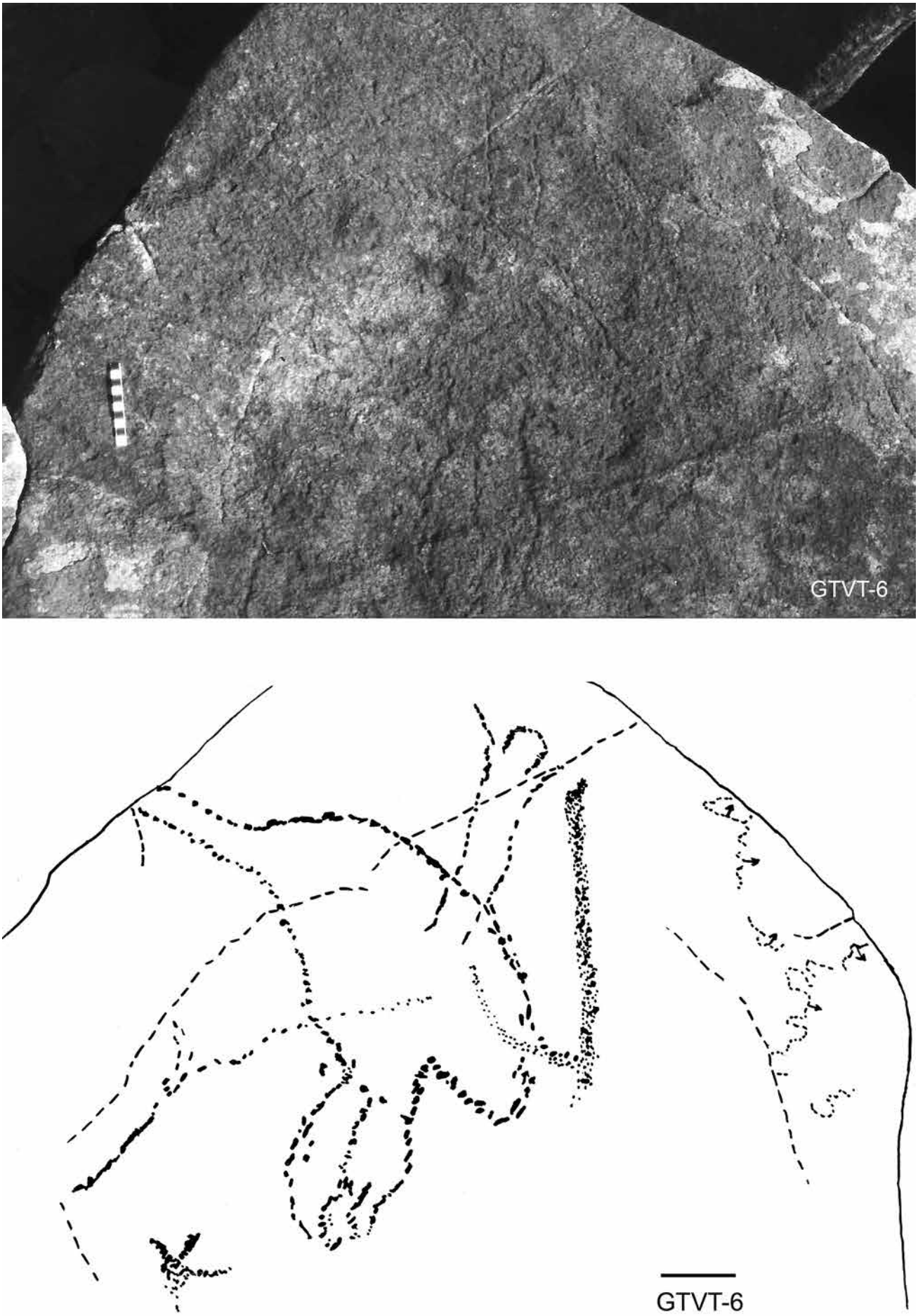


Figure 7.56

GTVT-7+14A

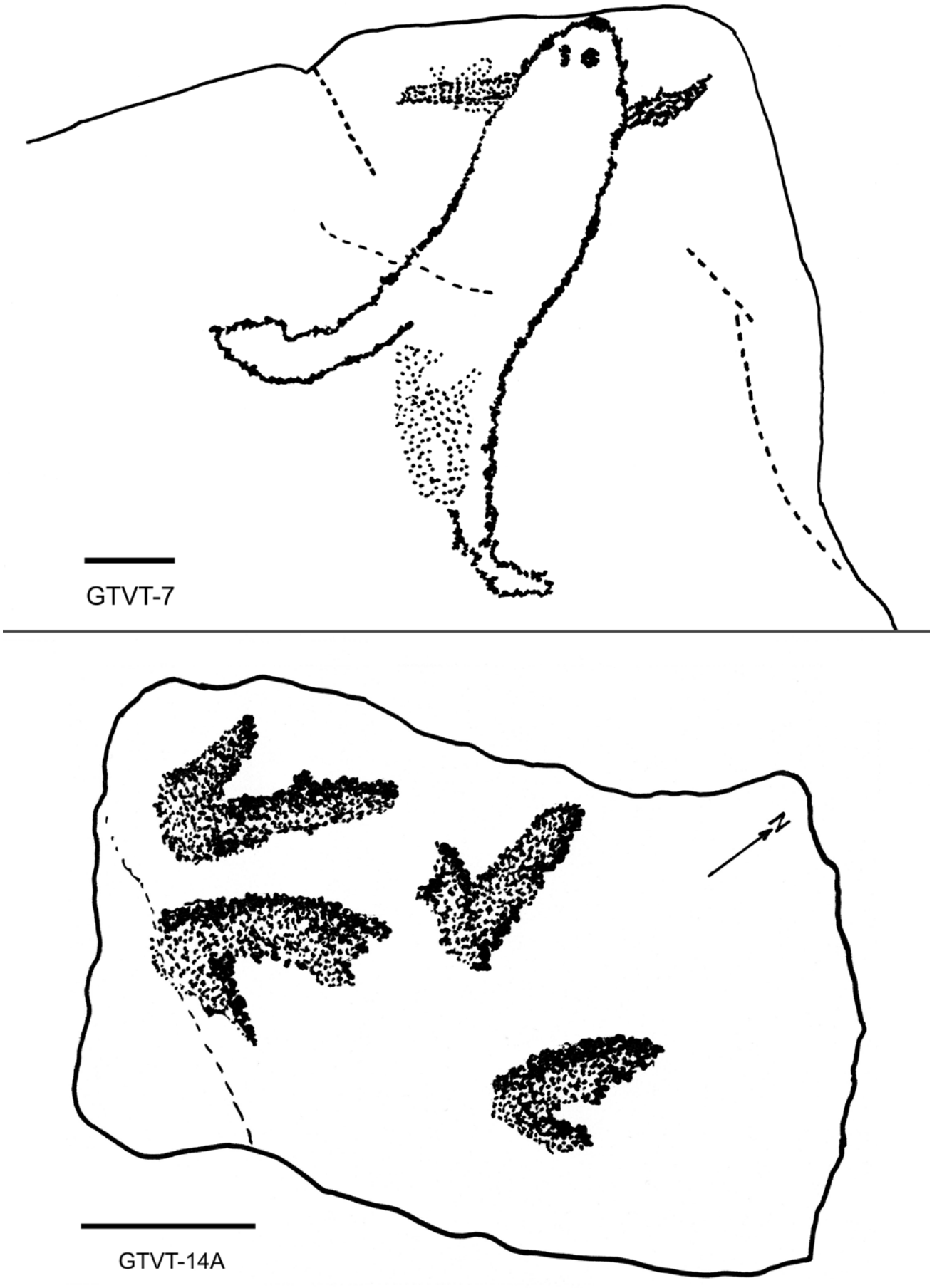


Figure 7.57

GTVT-8

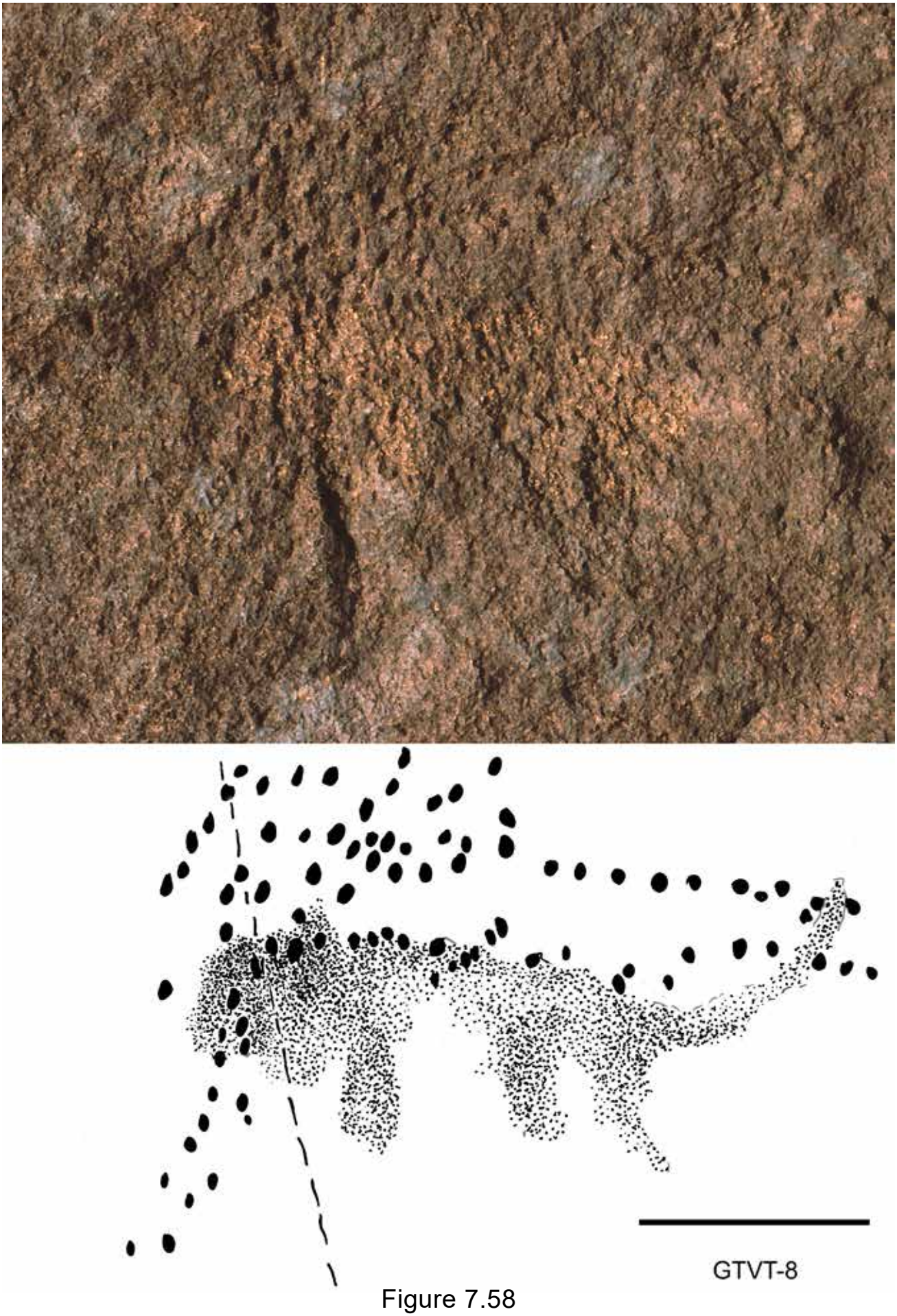


Figure 7.58

GTVT-9

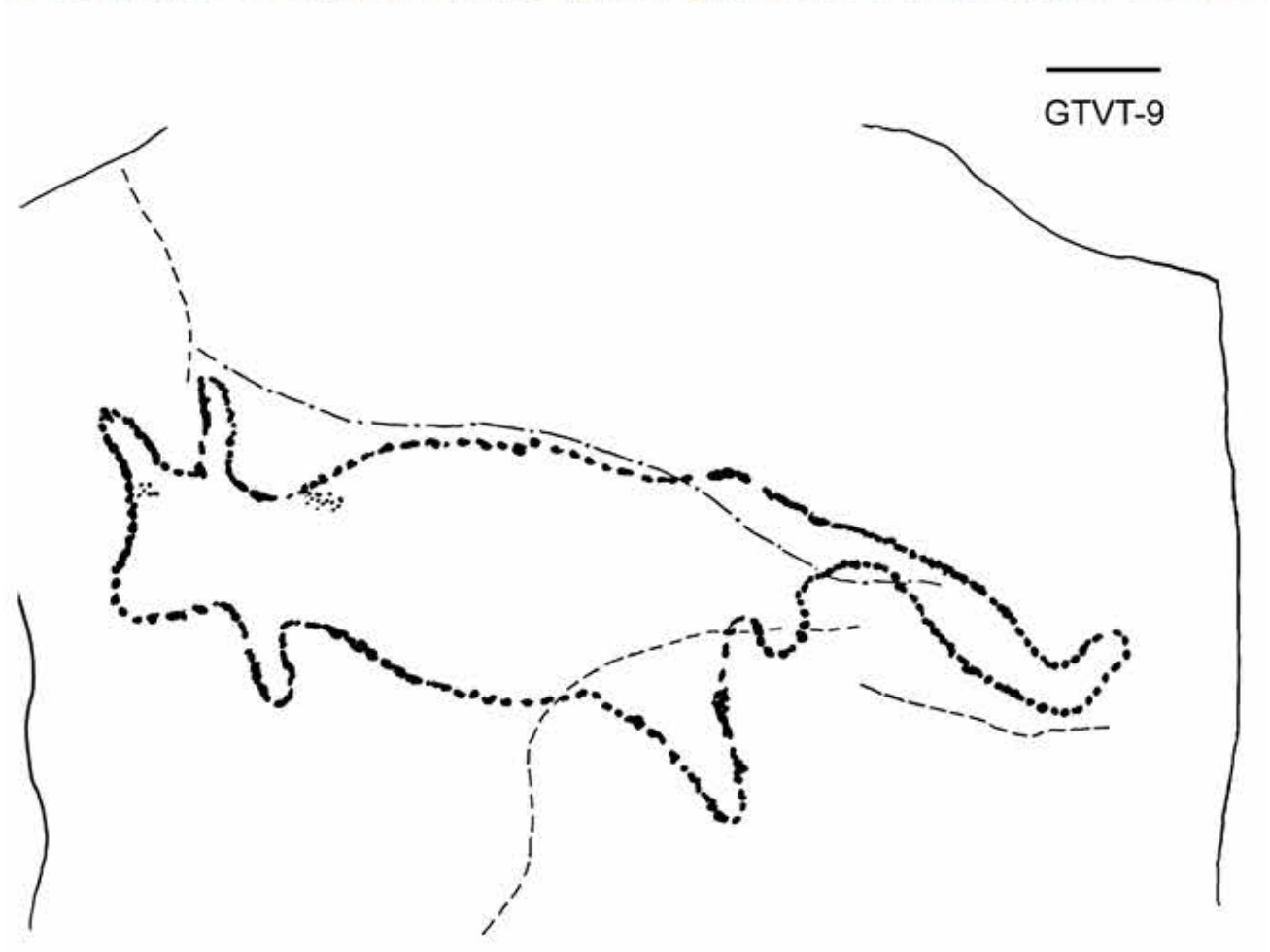


Figure 7.59

GTVT-10

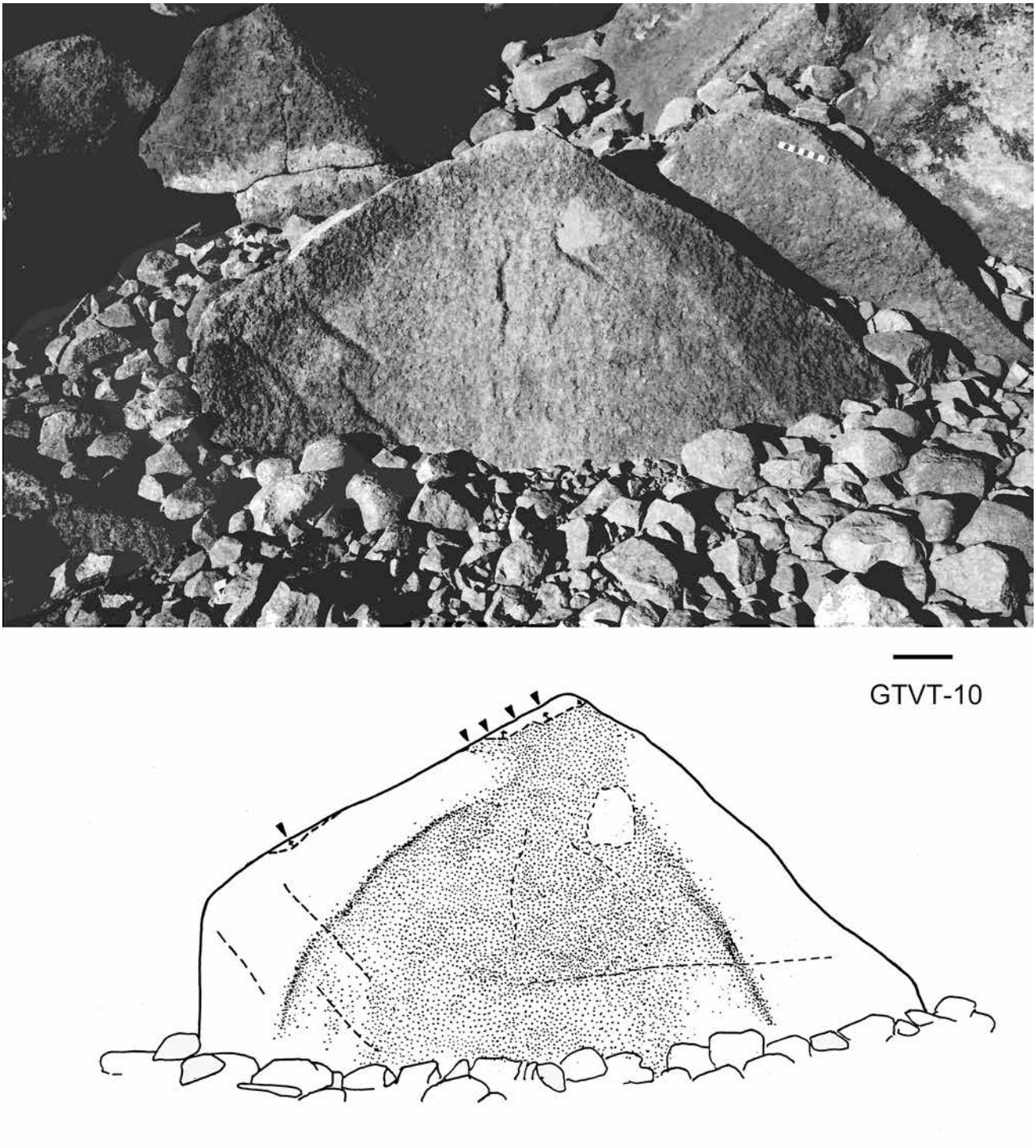


Figure 7.60

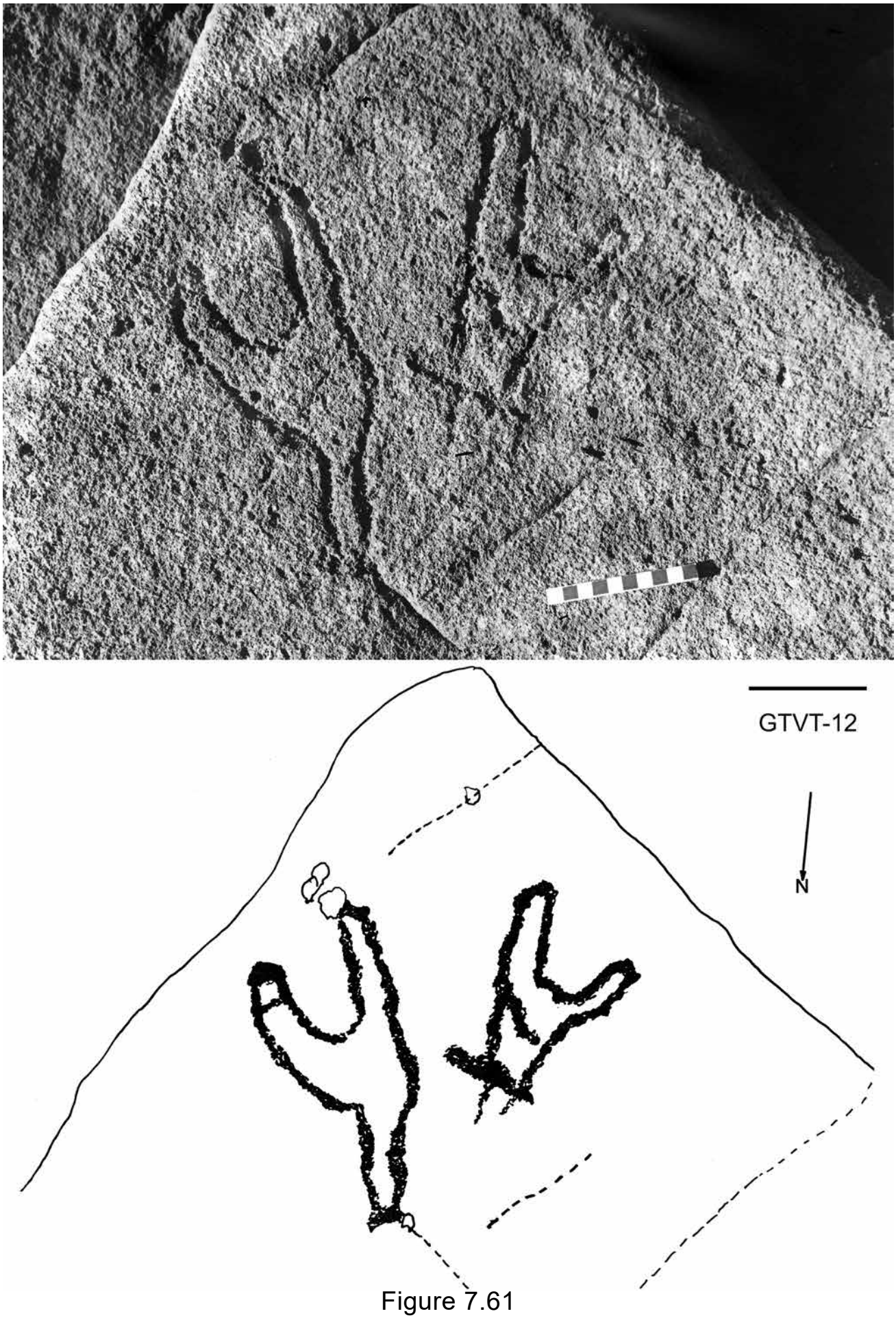


Figure 7.61

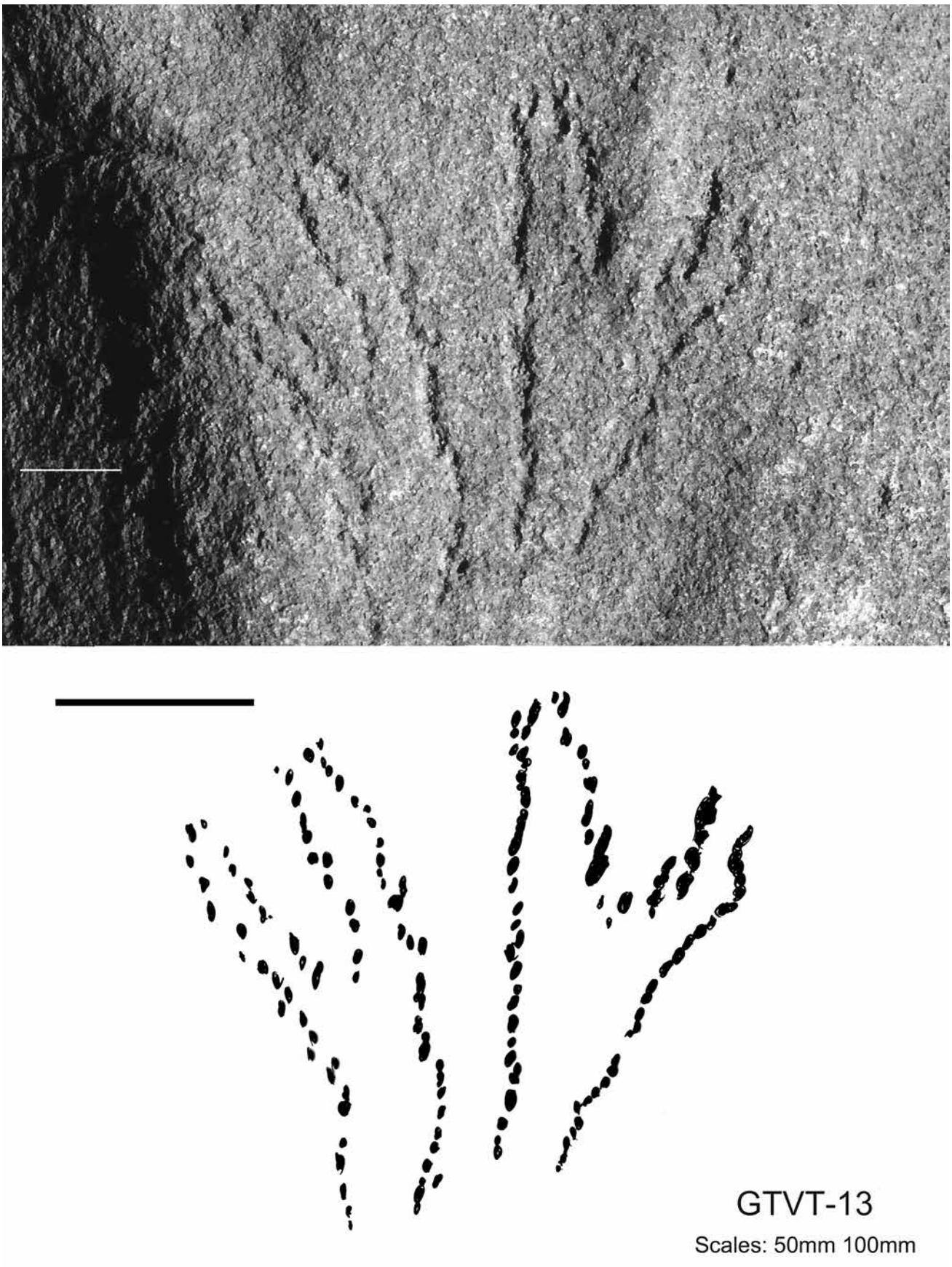


Figure 7.62

GTVT-14

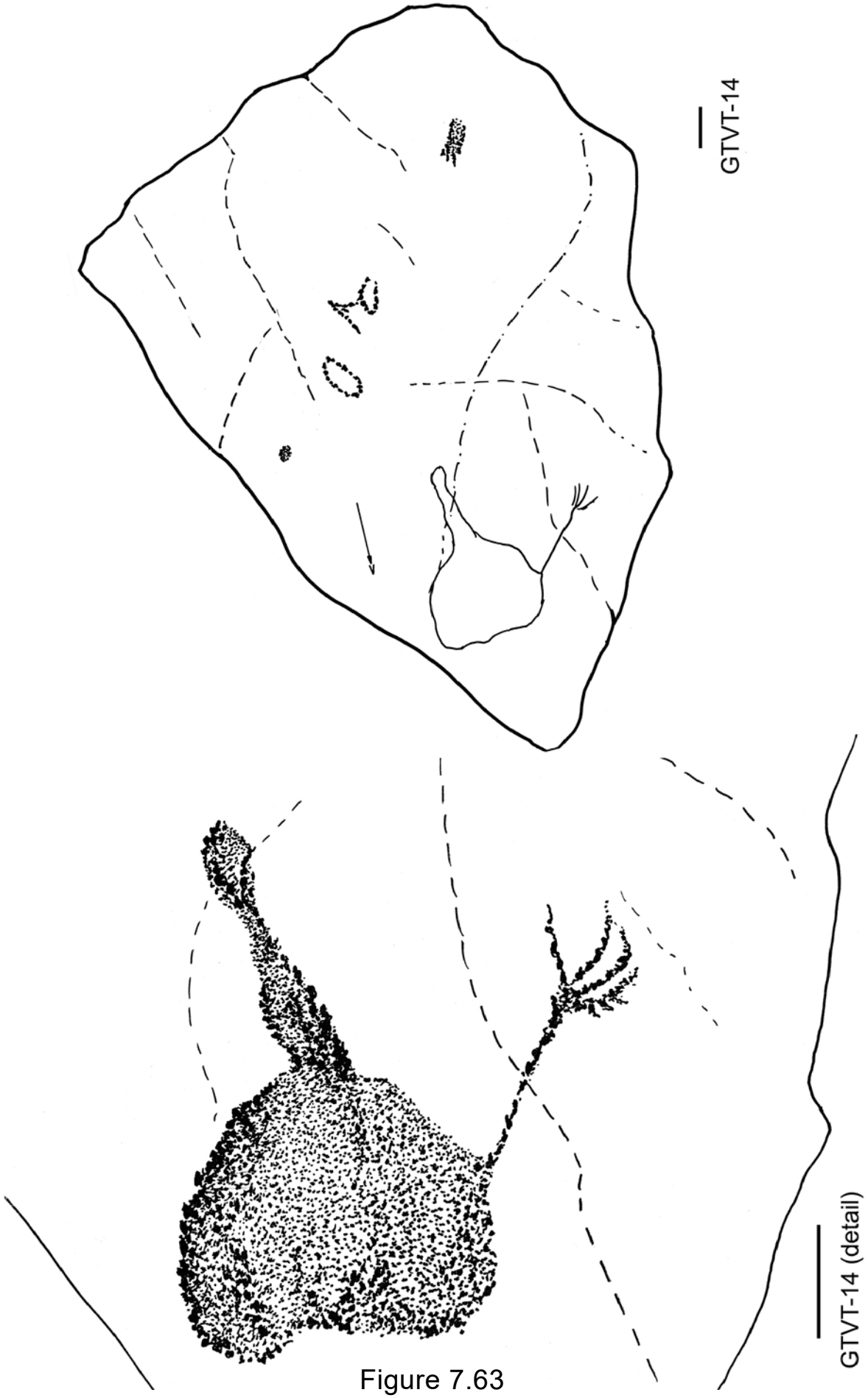


Figure 7.63

GTVT-15

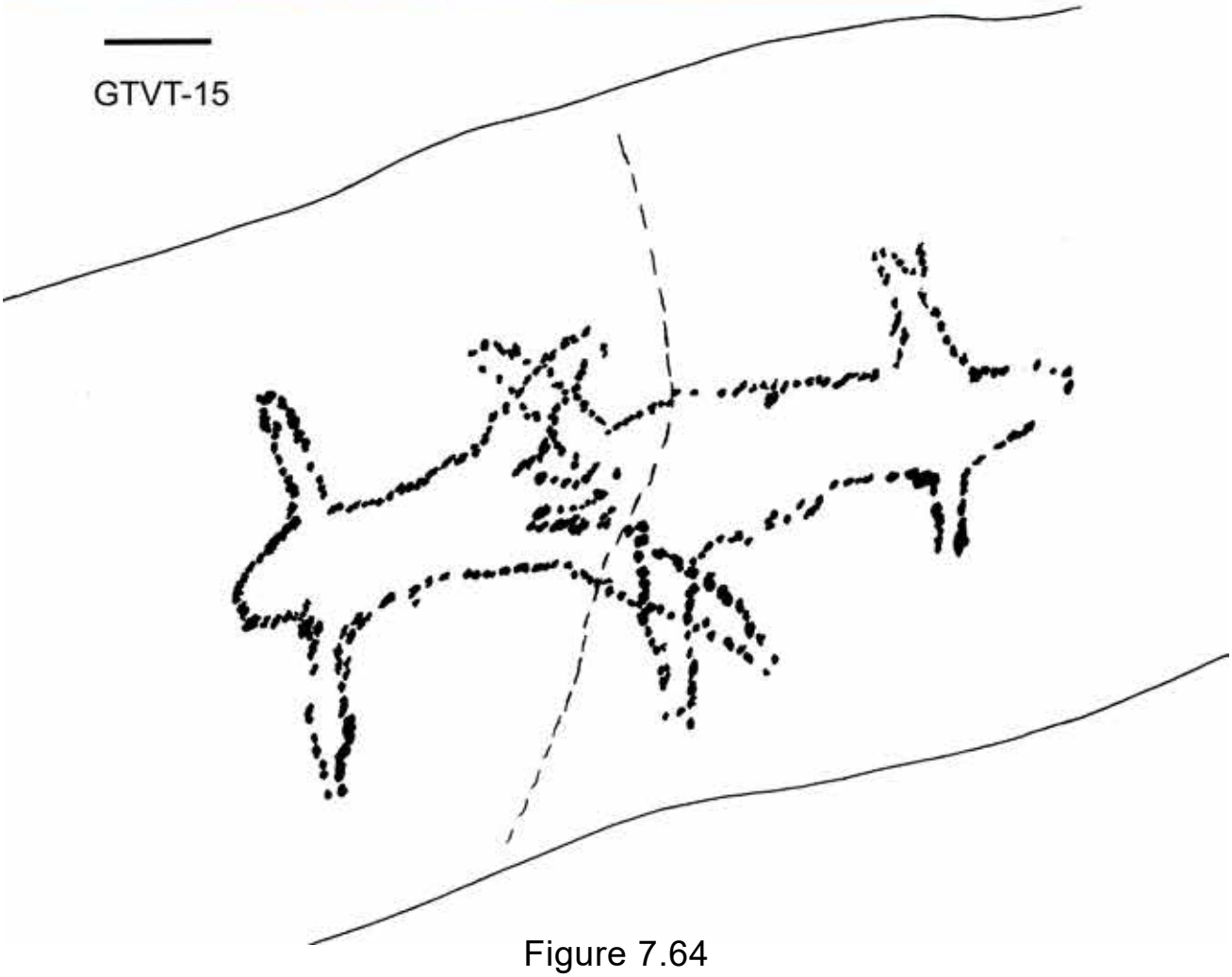


Figure 7.64

GTVT-16+17

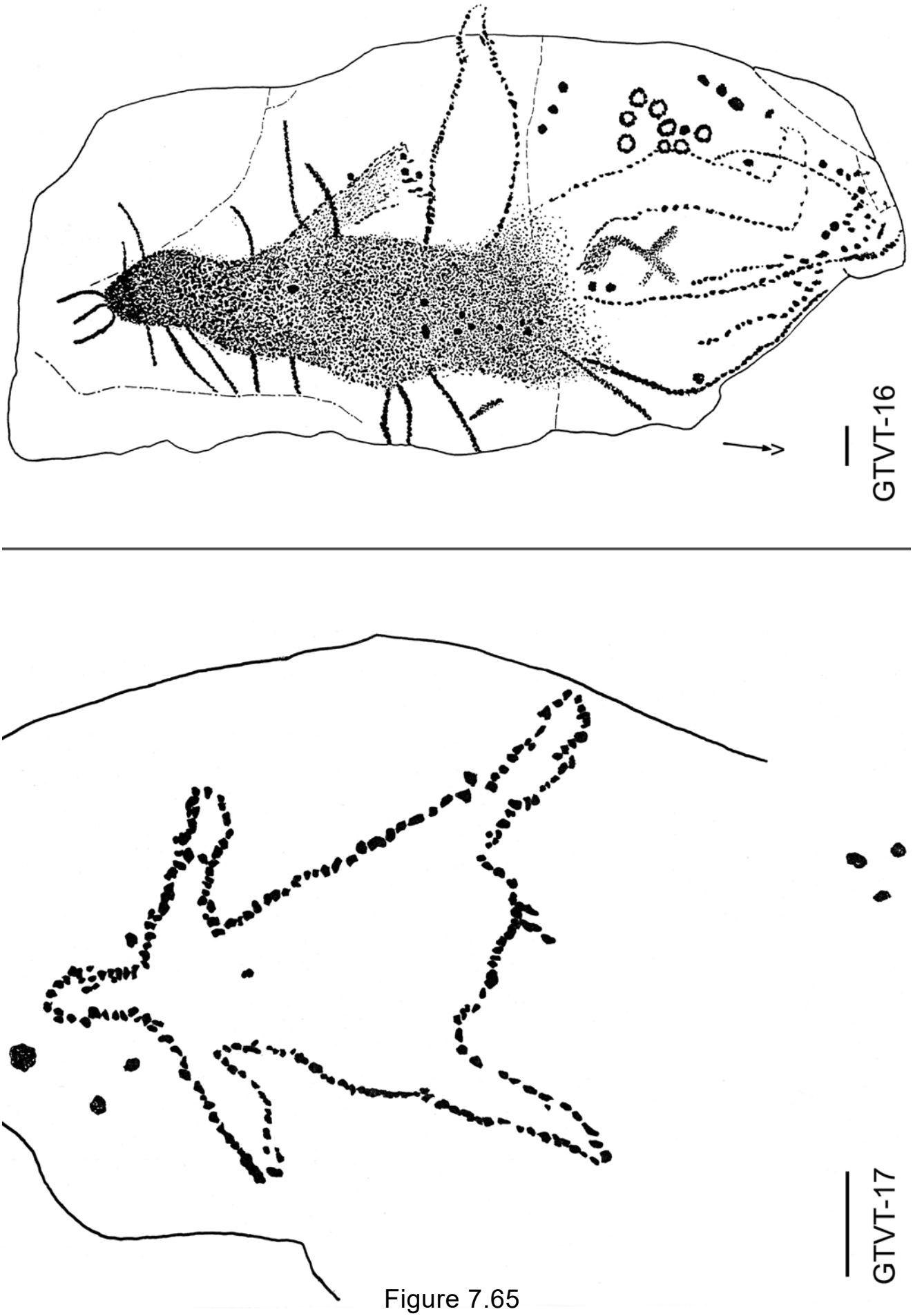


Figure 7.65

GTVT-18

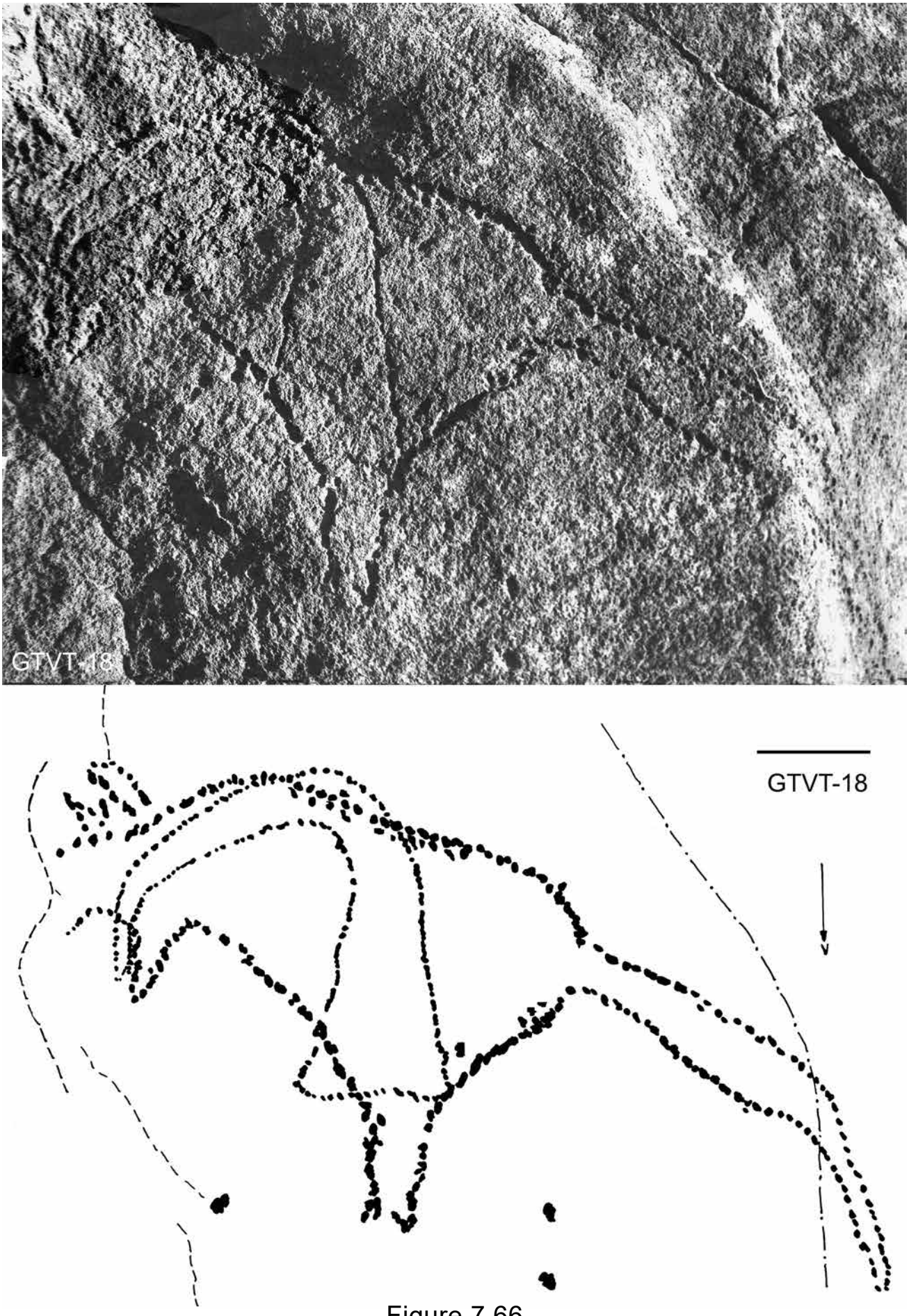


Figure 7.66

GTVT-20+21

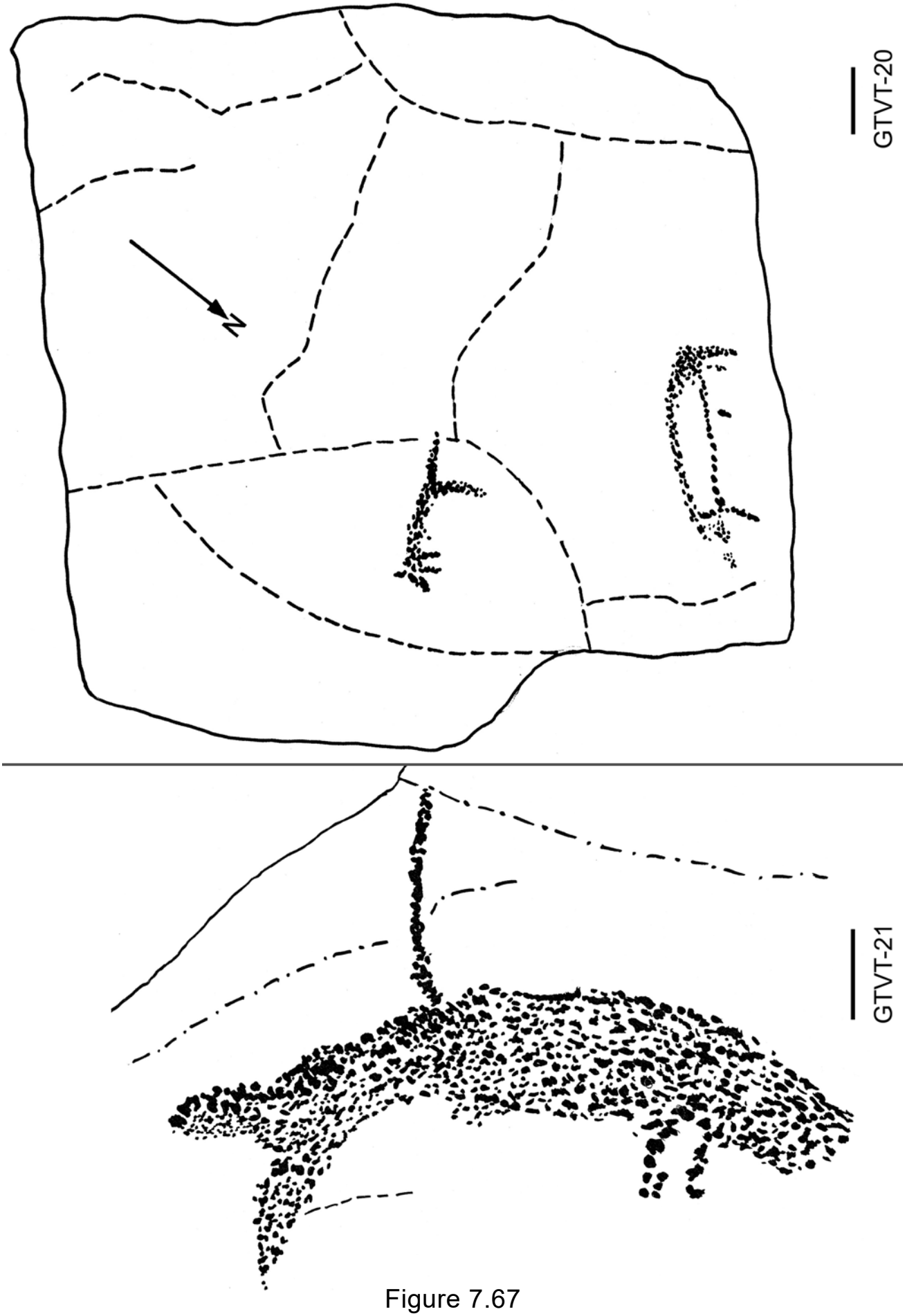


Figure 7.67

GTVT-23+25

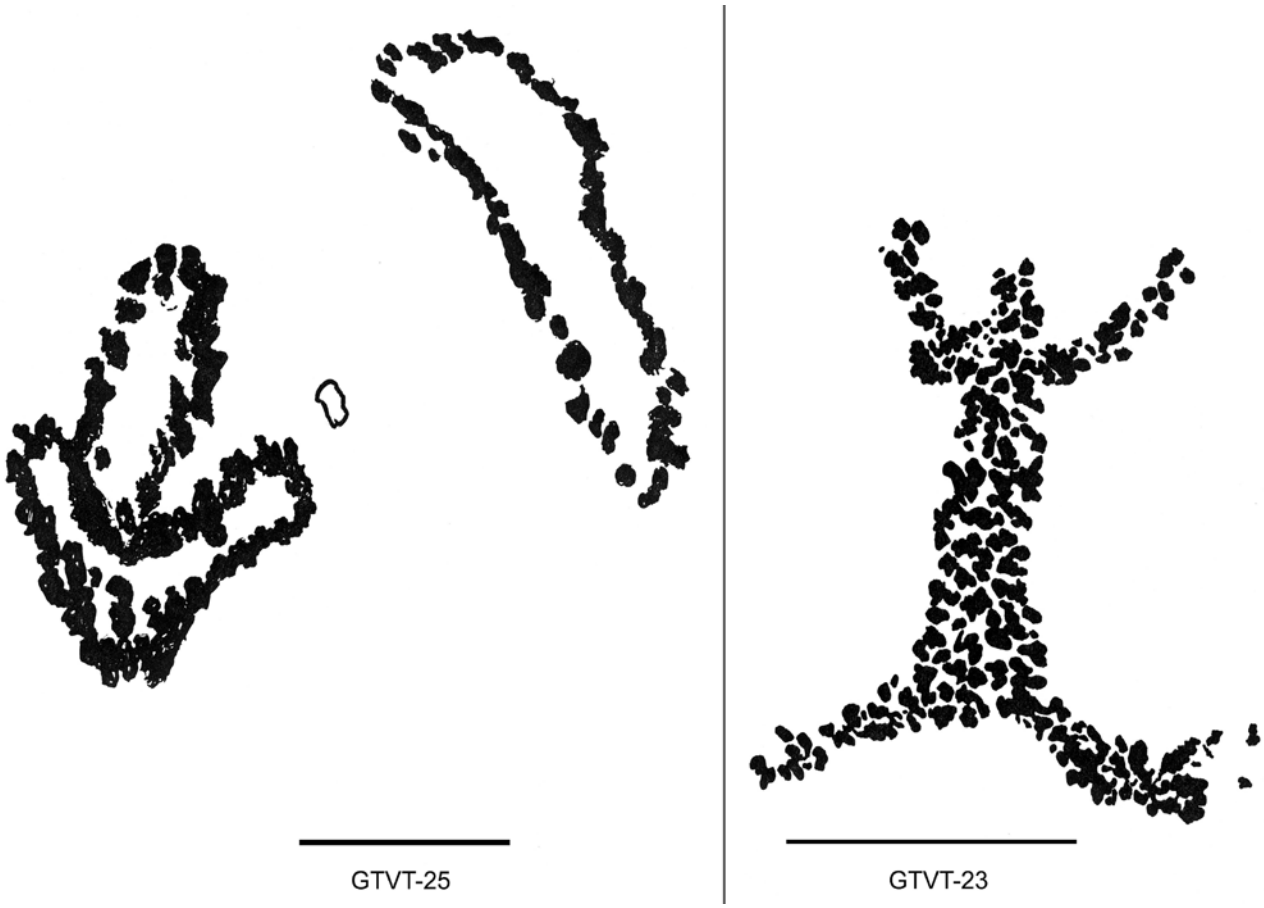


Figure 7.68

GTVT-26+28

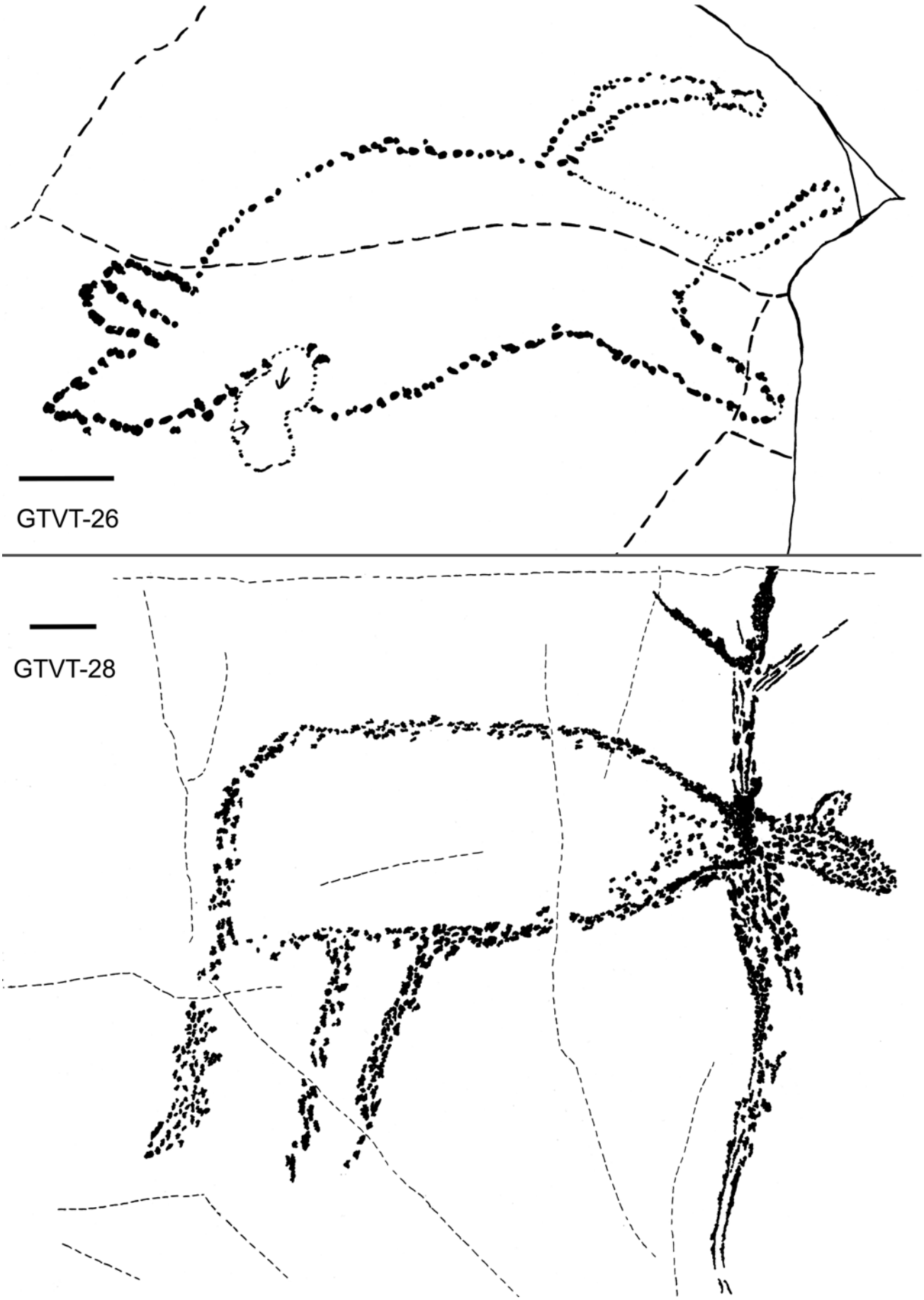


Figure 7.69

GTVT-27

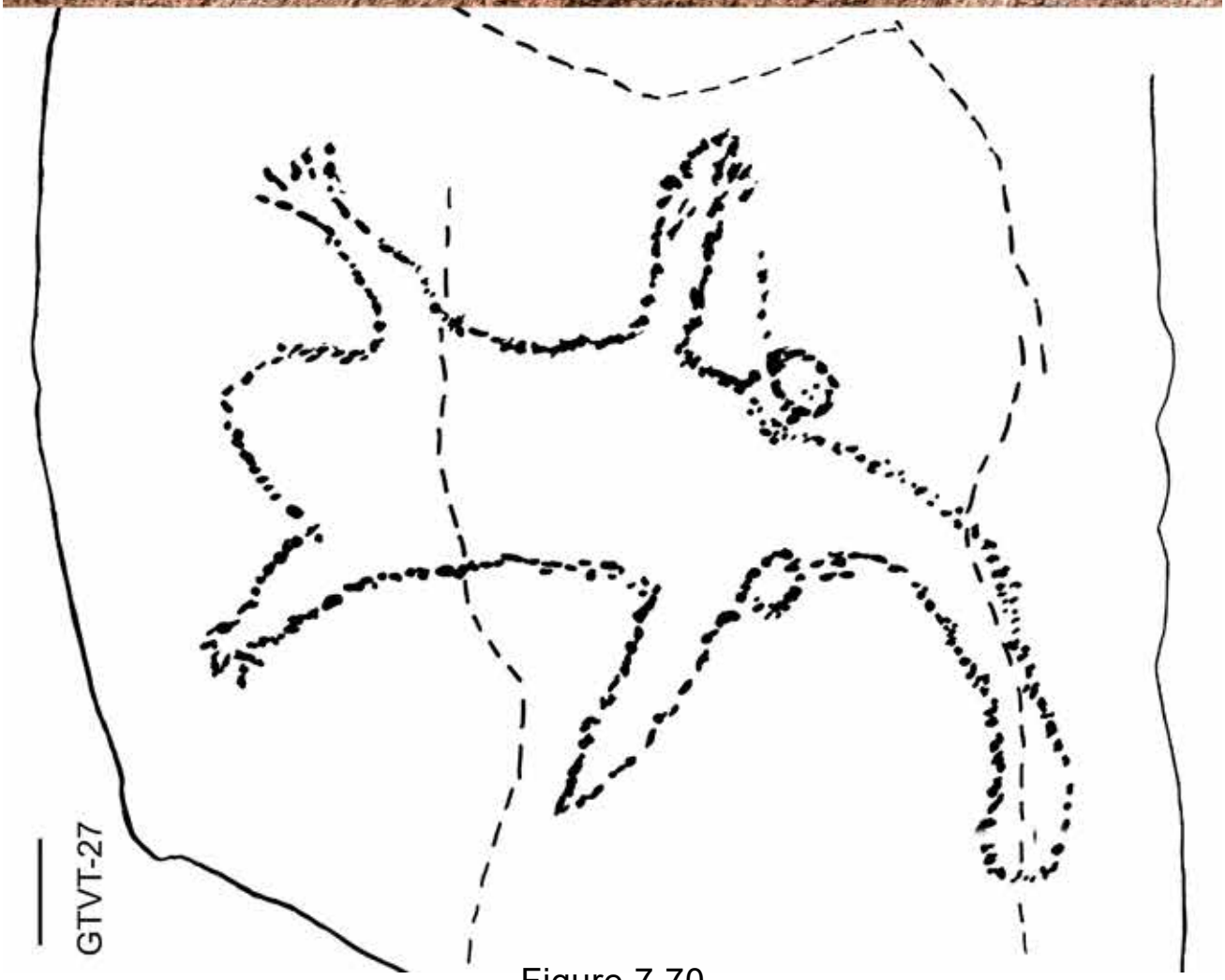


Figure 7.70

GTVT-29

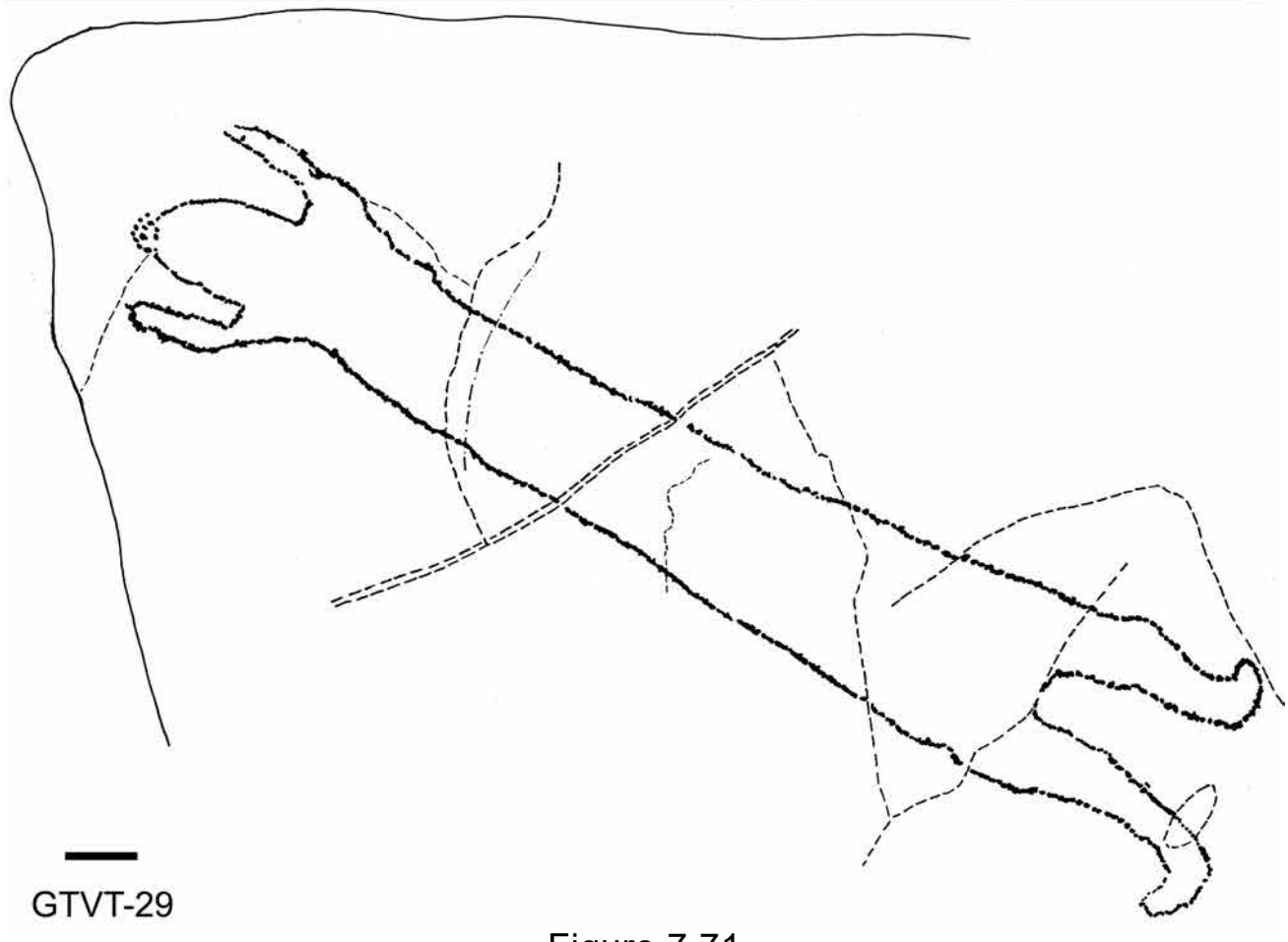
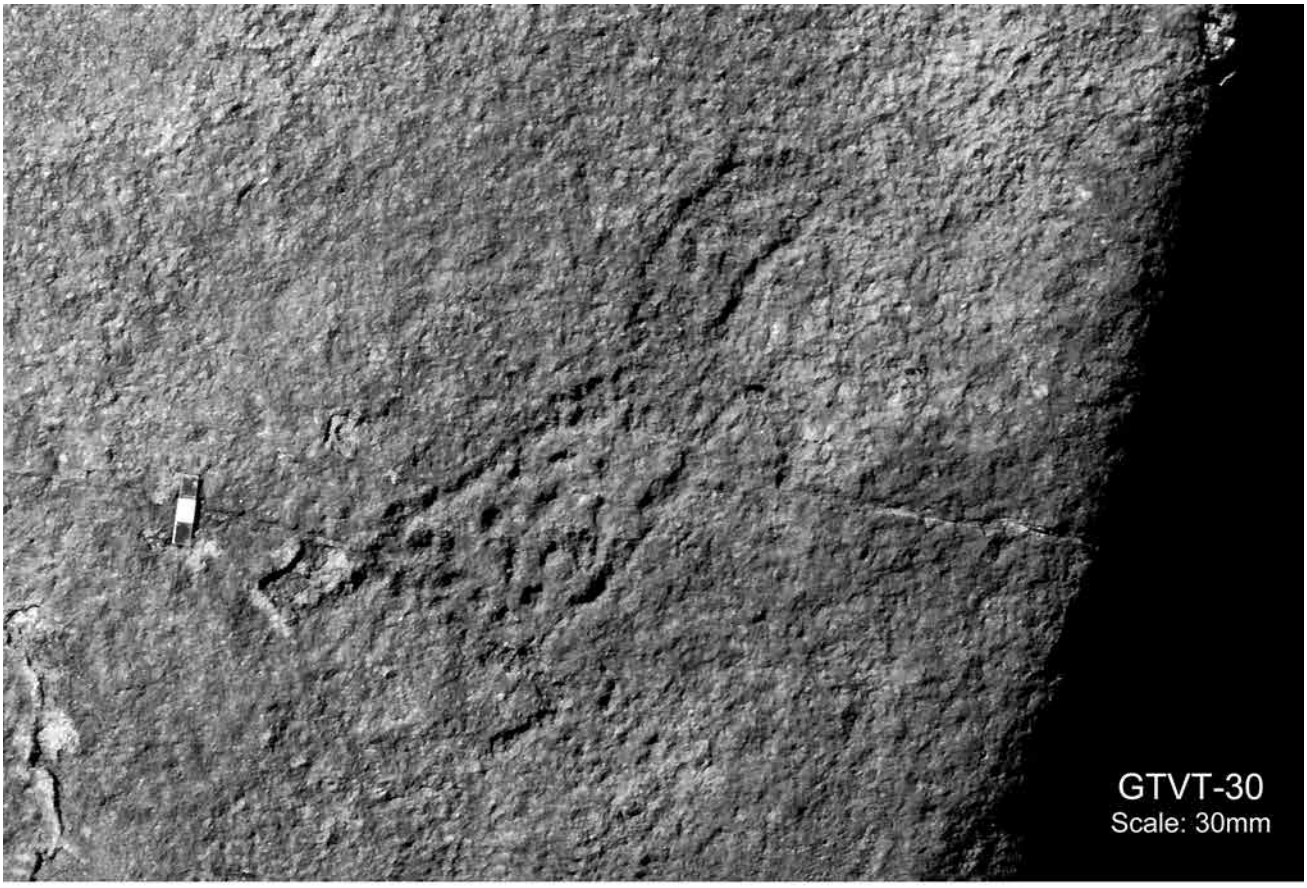


Figure 7.71

GTVT-30



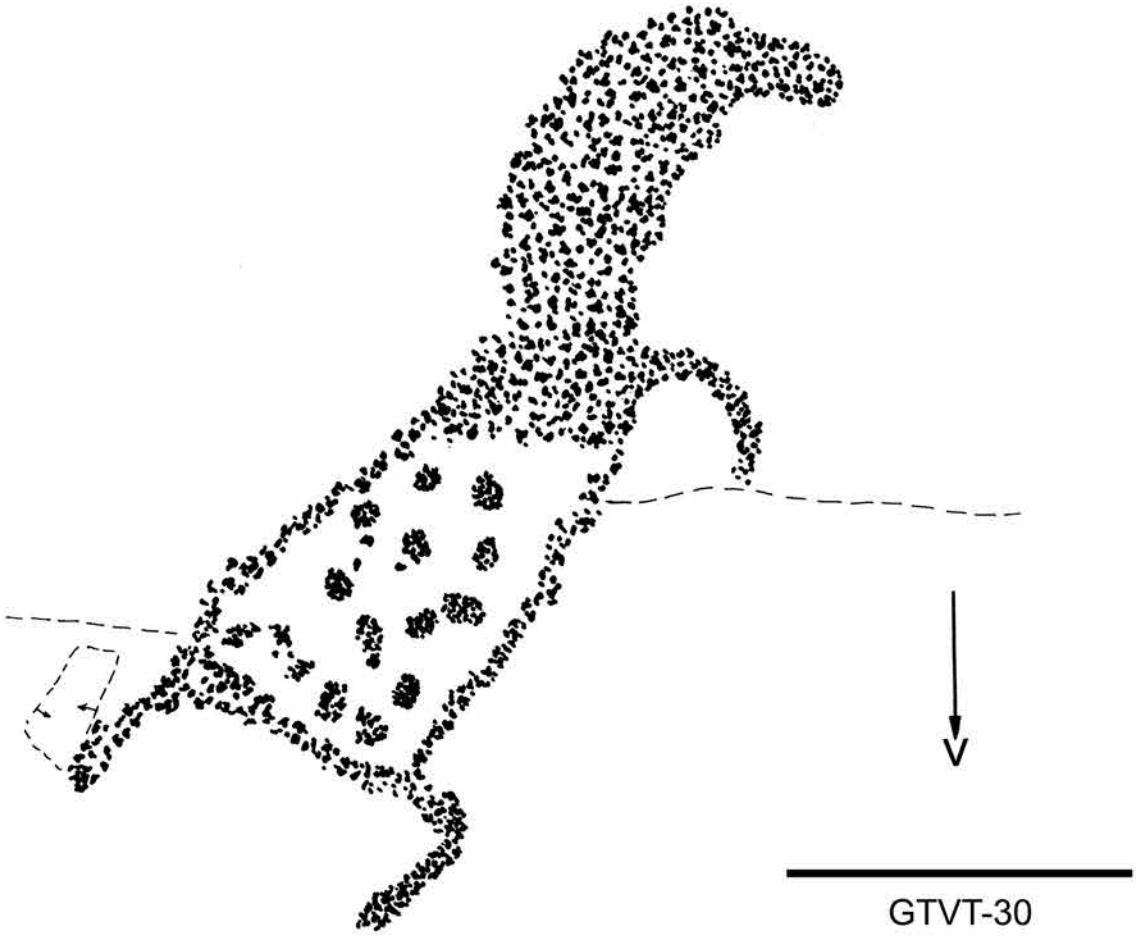


Figure 7.72

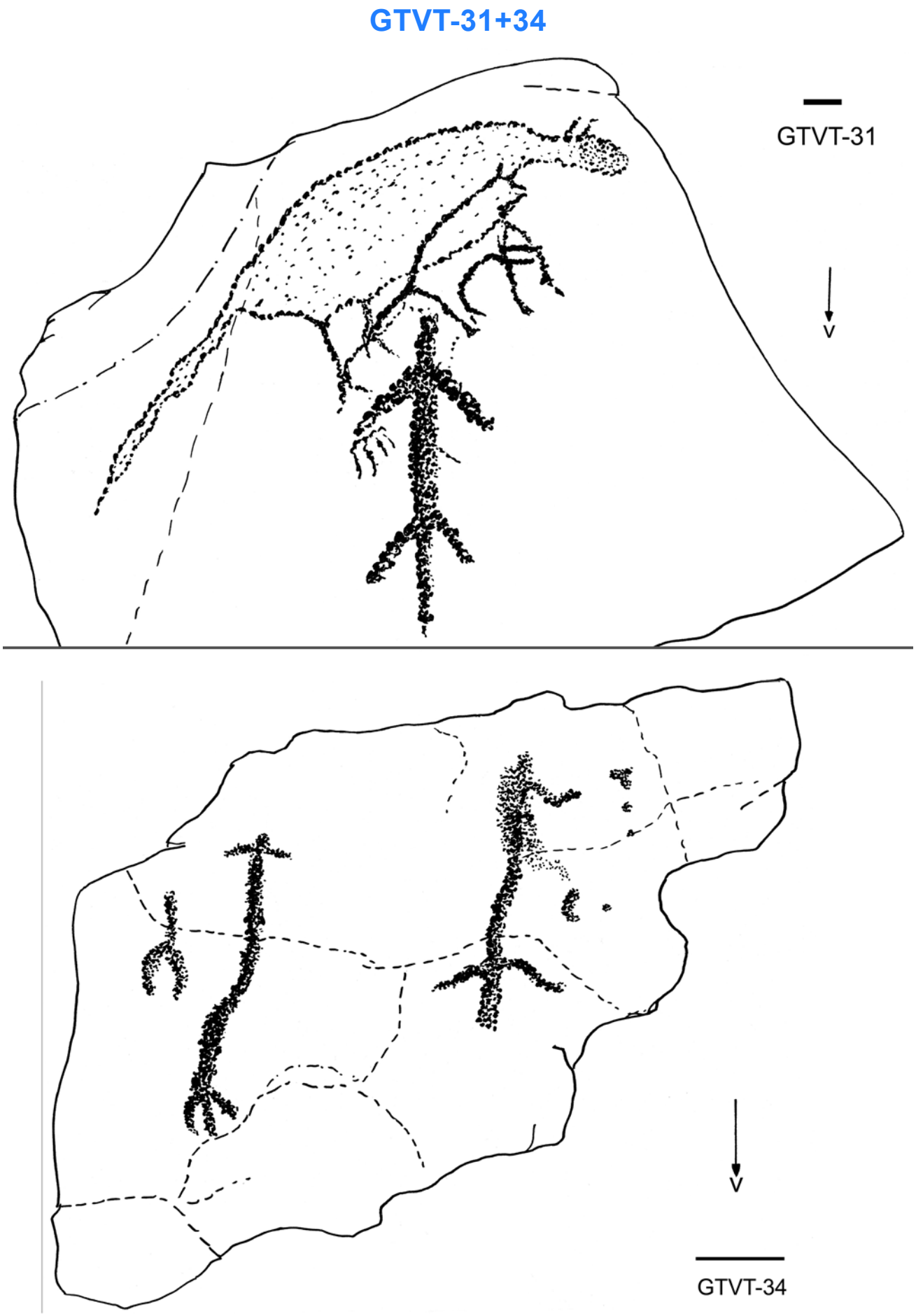


Figure 7.73

GTVT-32+33

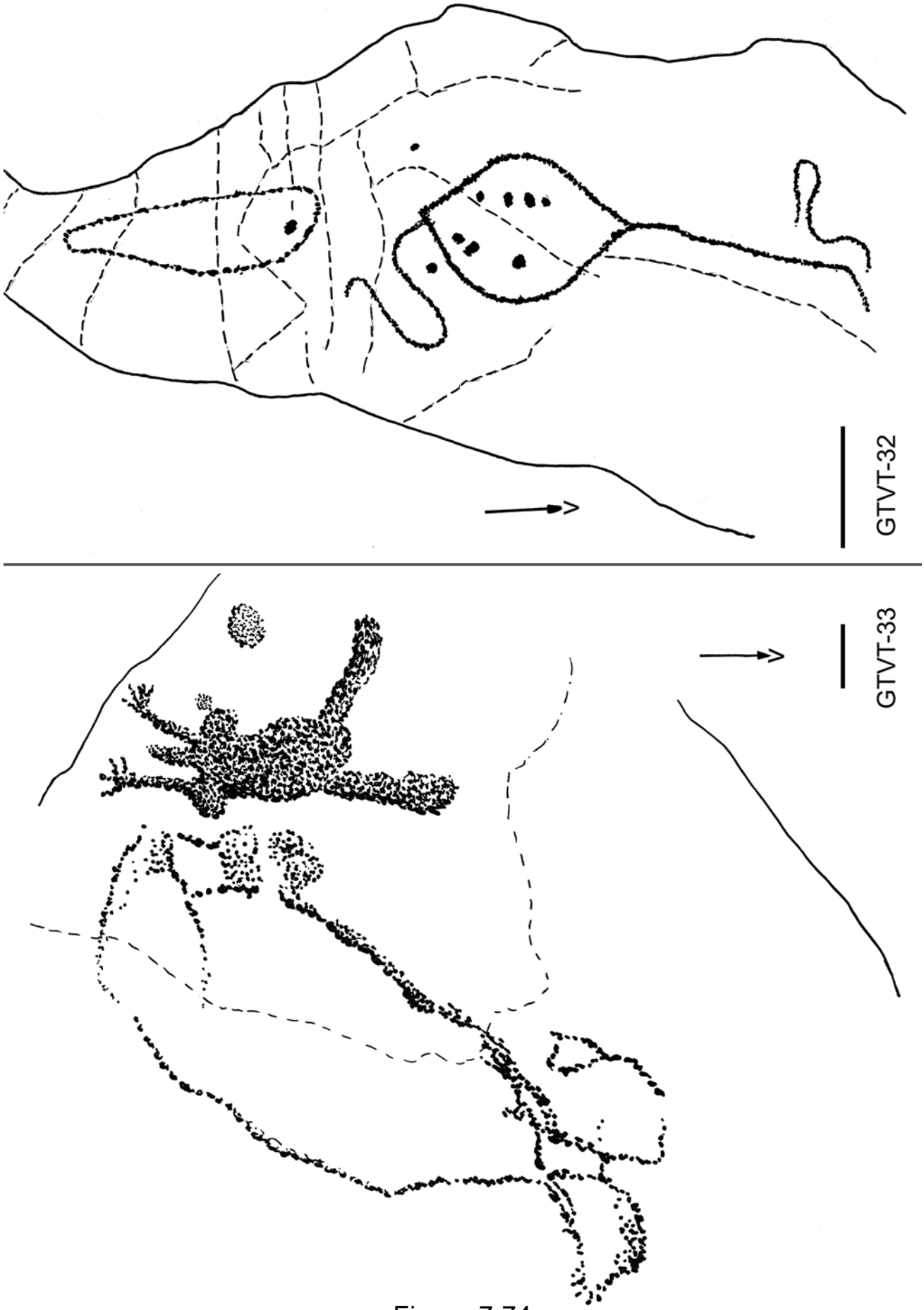


Figure 7.74

GTVT-35+37+38A

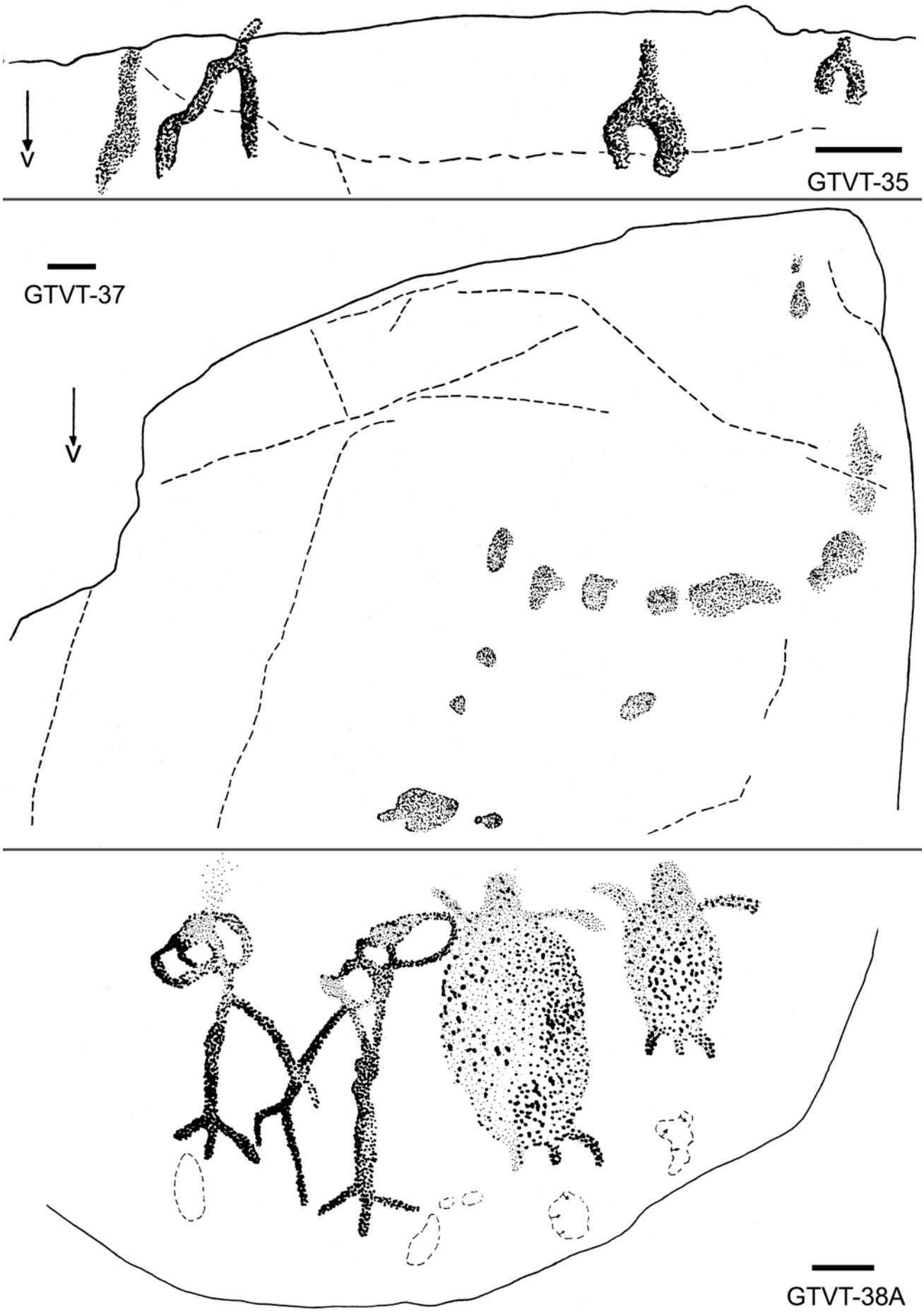


Figure 7.75

GTVT-38+39

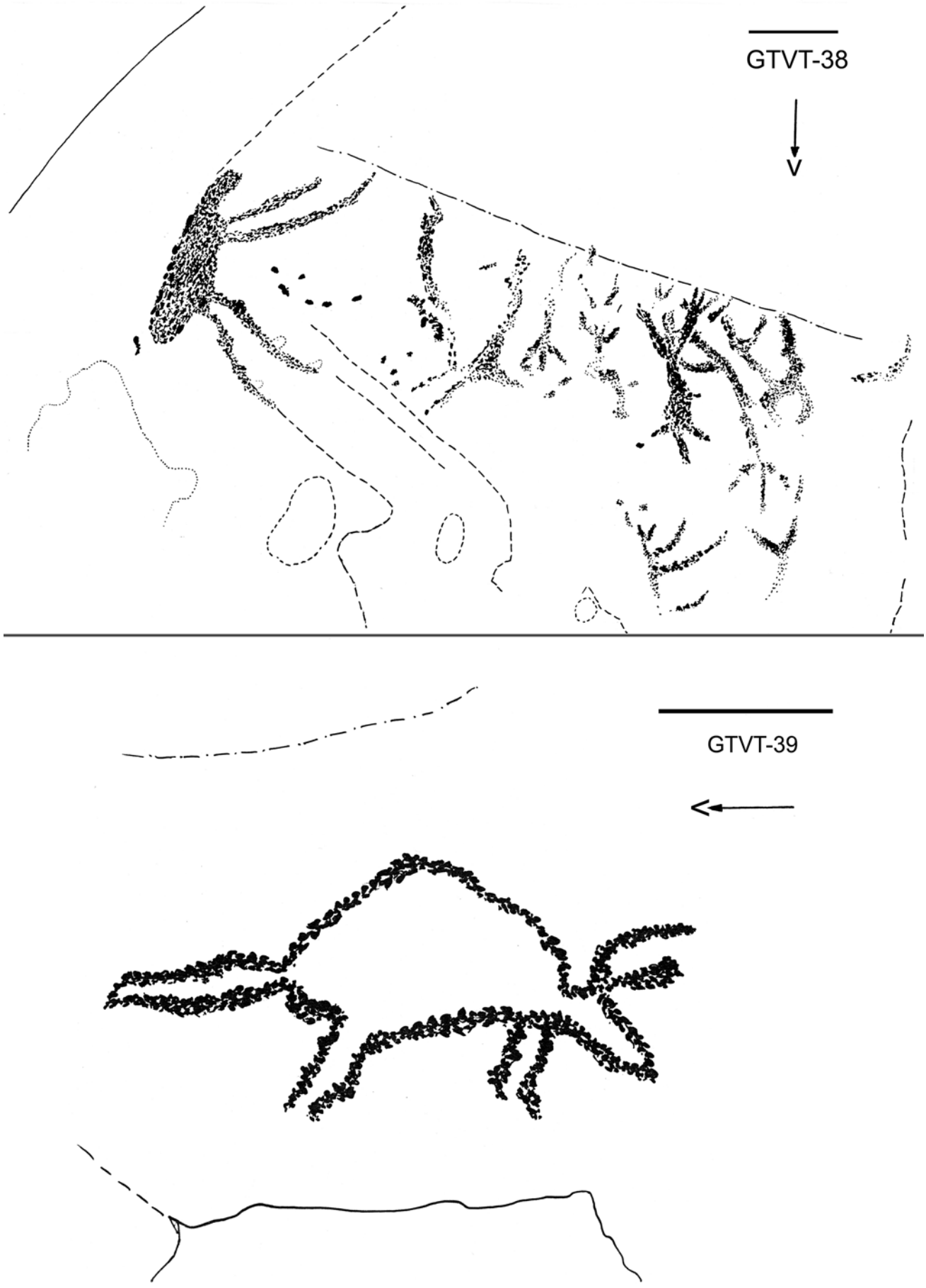


Figure 7.76

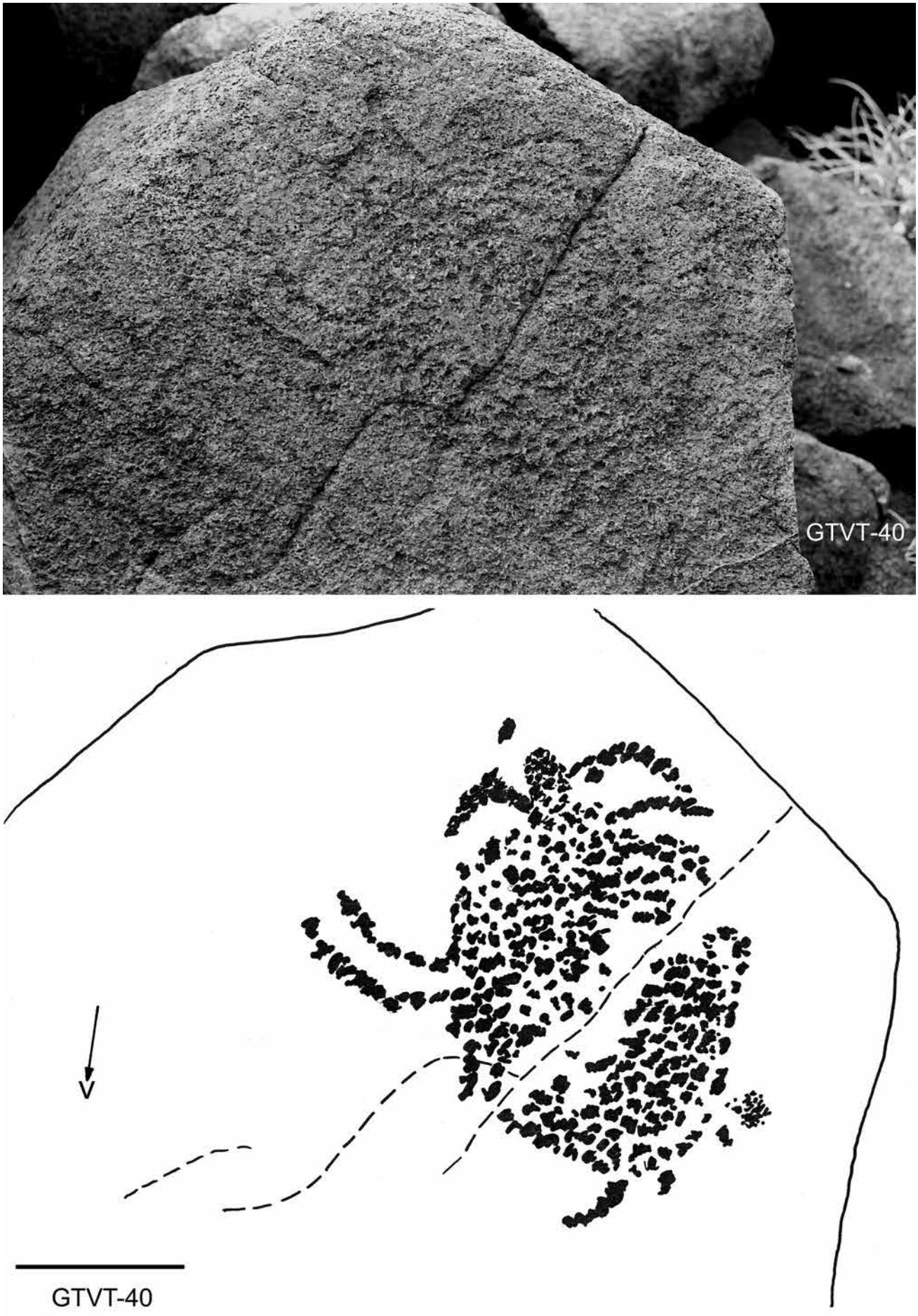


Figure 7.77

GTVT-41+42

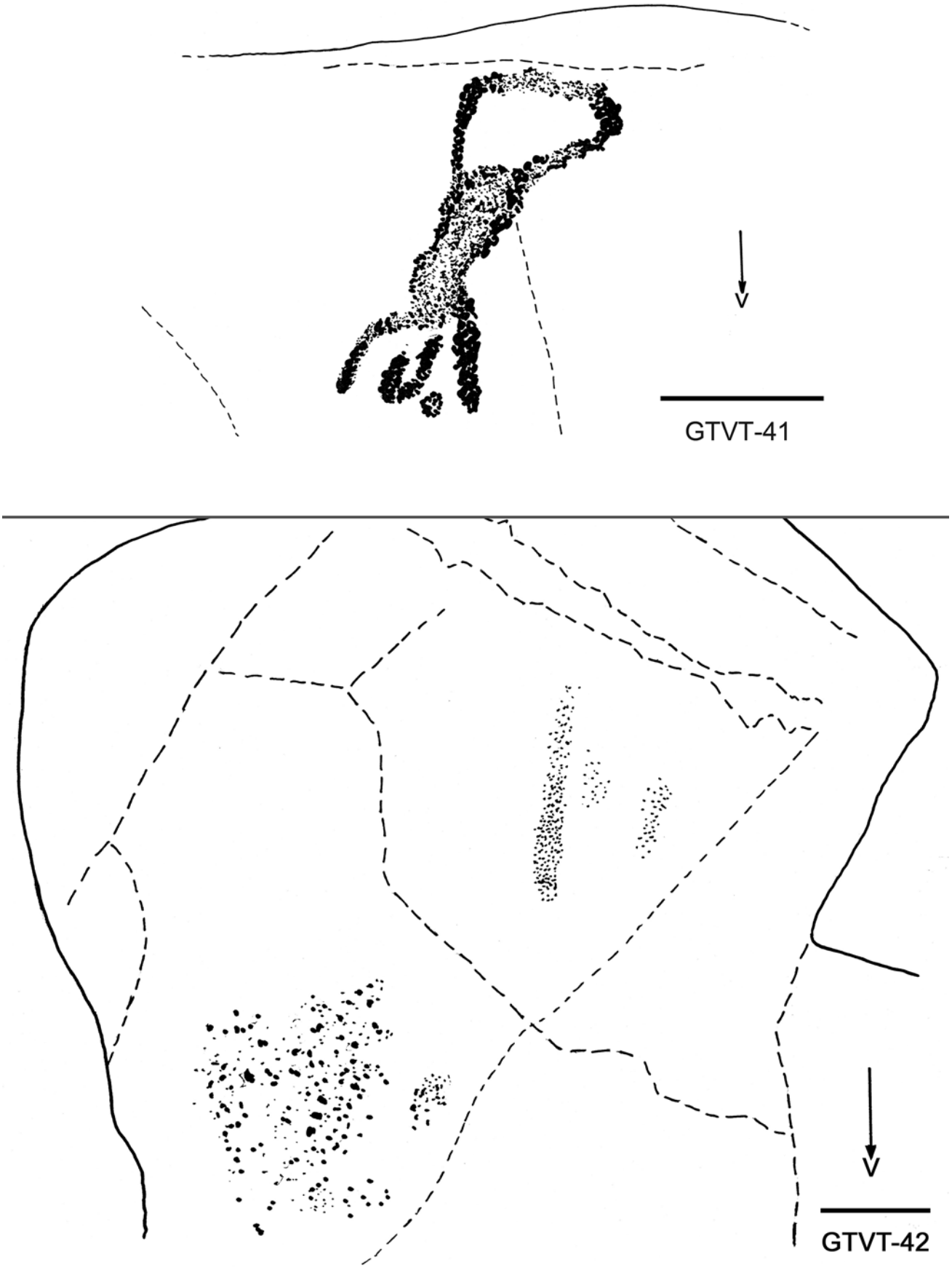
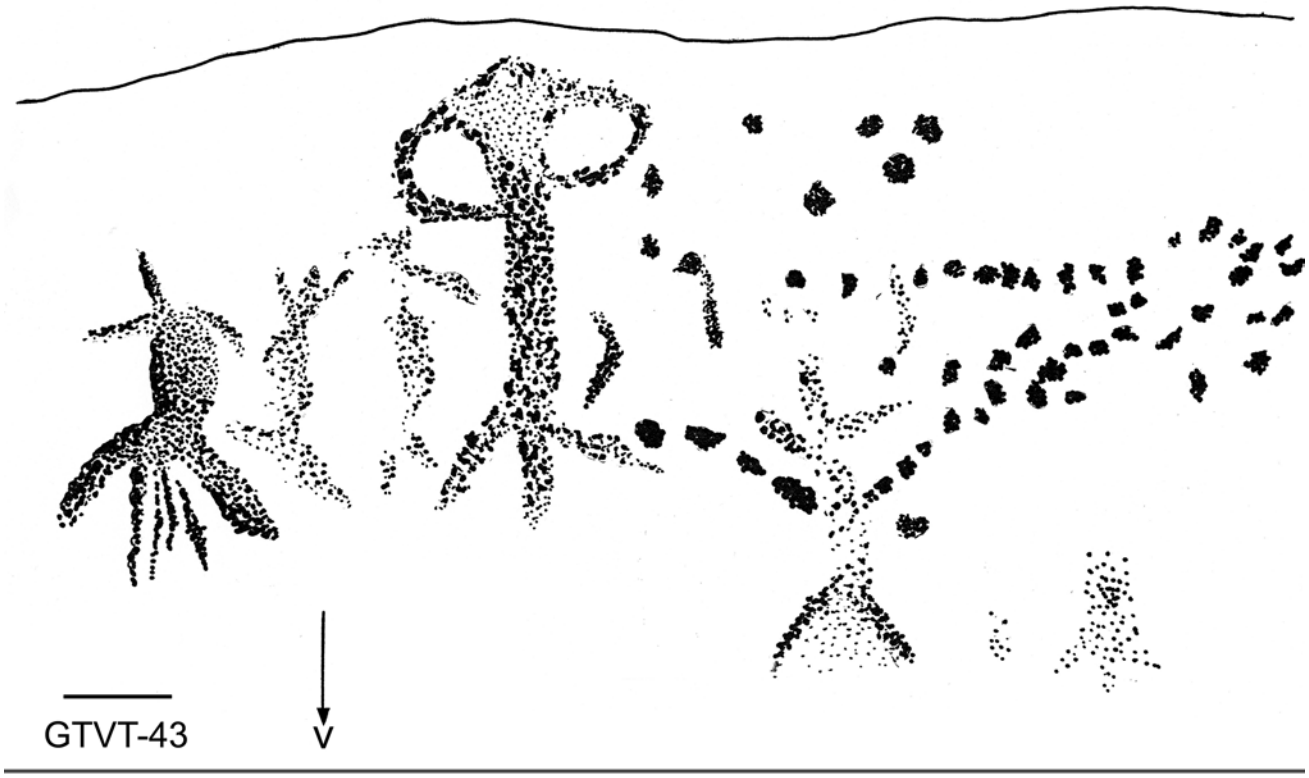


Figure 7.78

GTVT-43+44



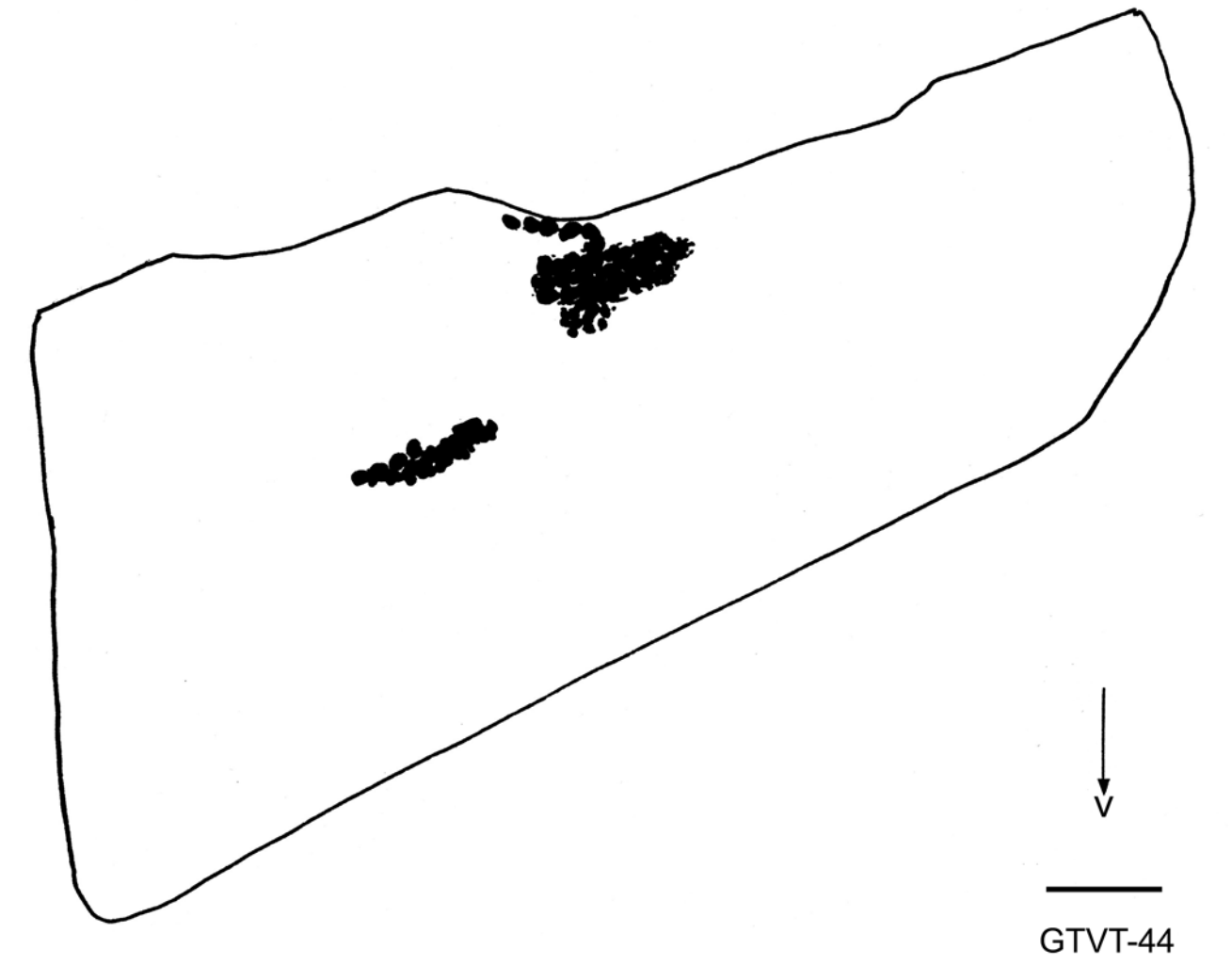


Figure 7.79

GTVT-45

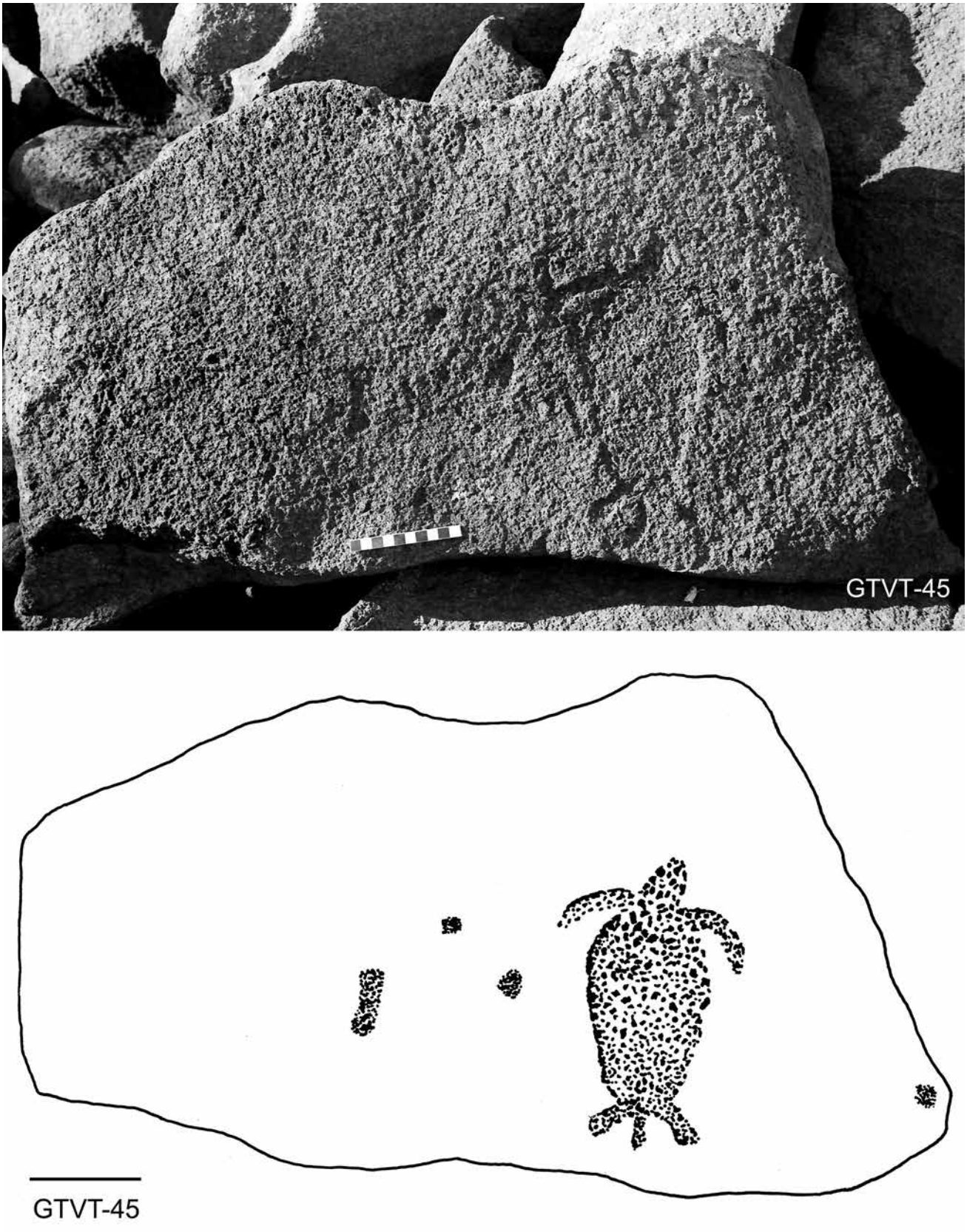


Figure 7.80

GTVT-46,47+48

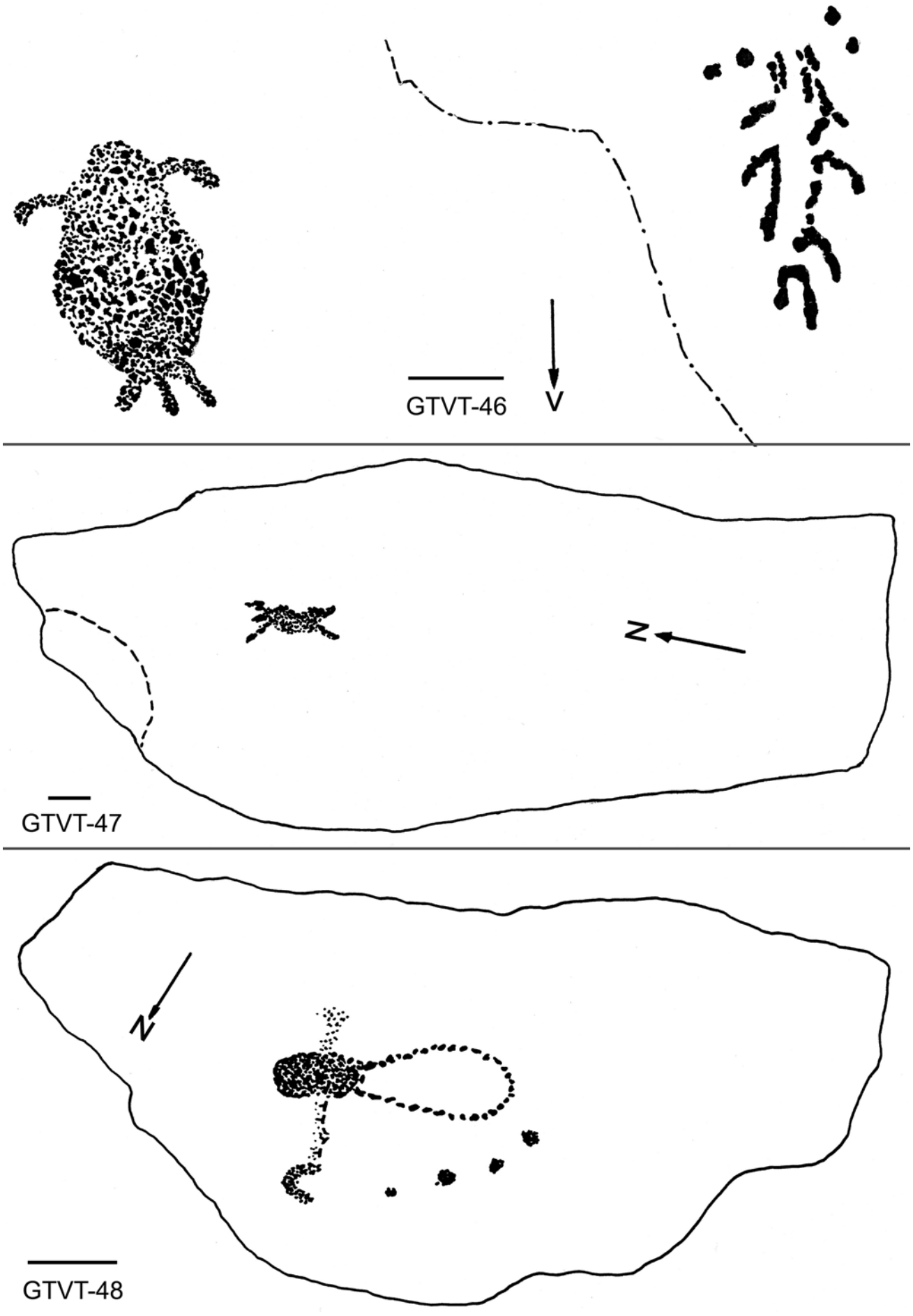
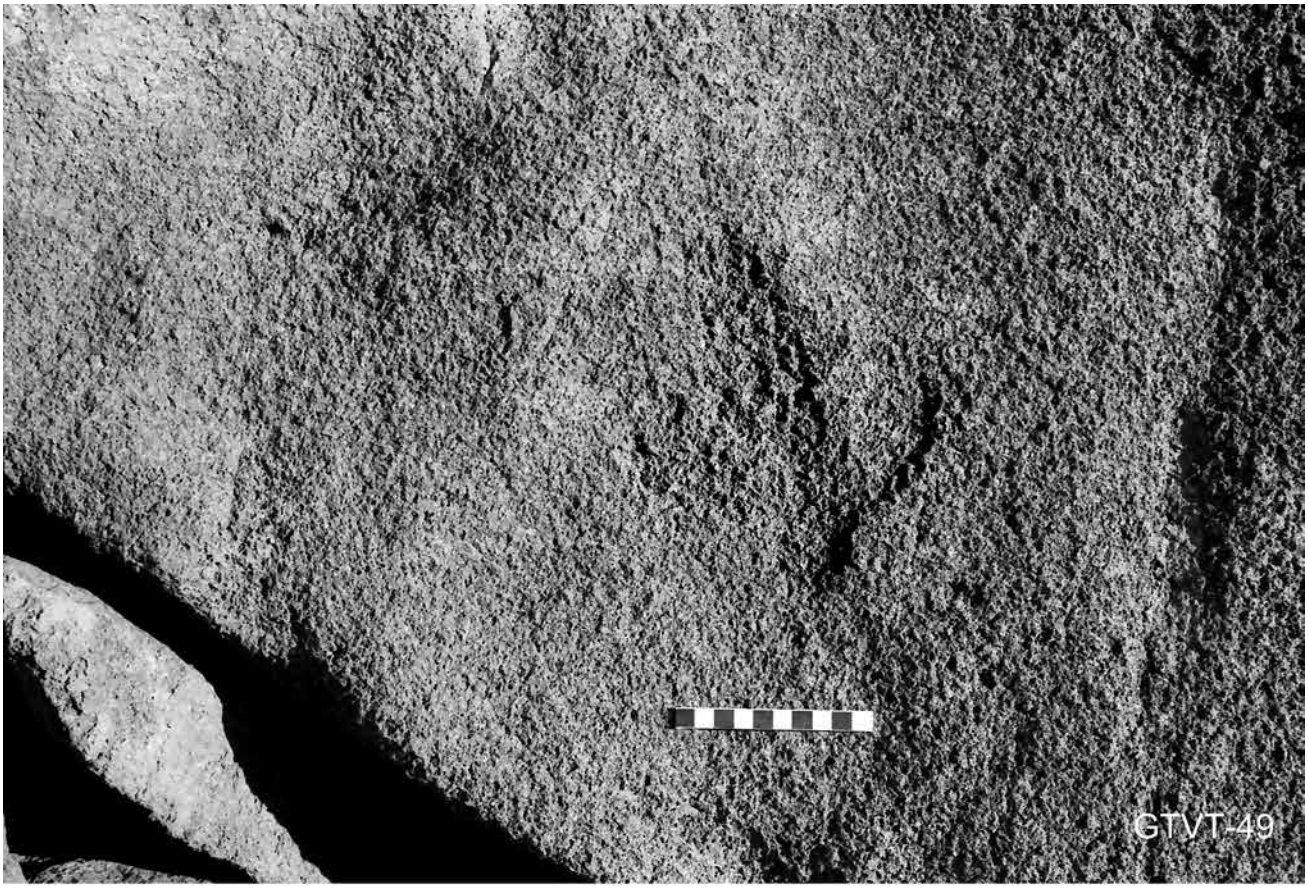


Figure 7.81

GTVT-49



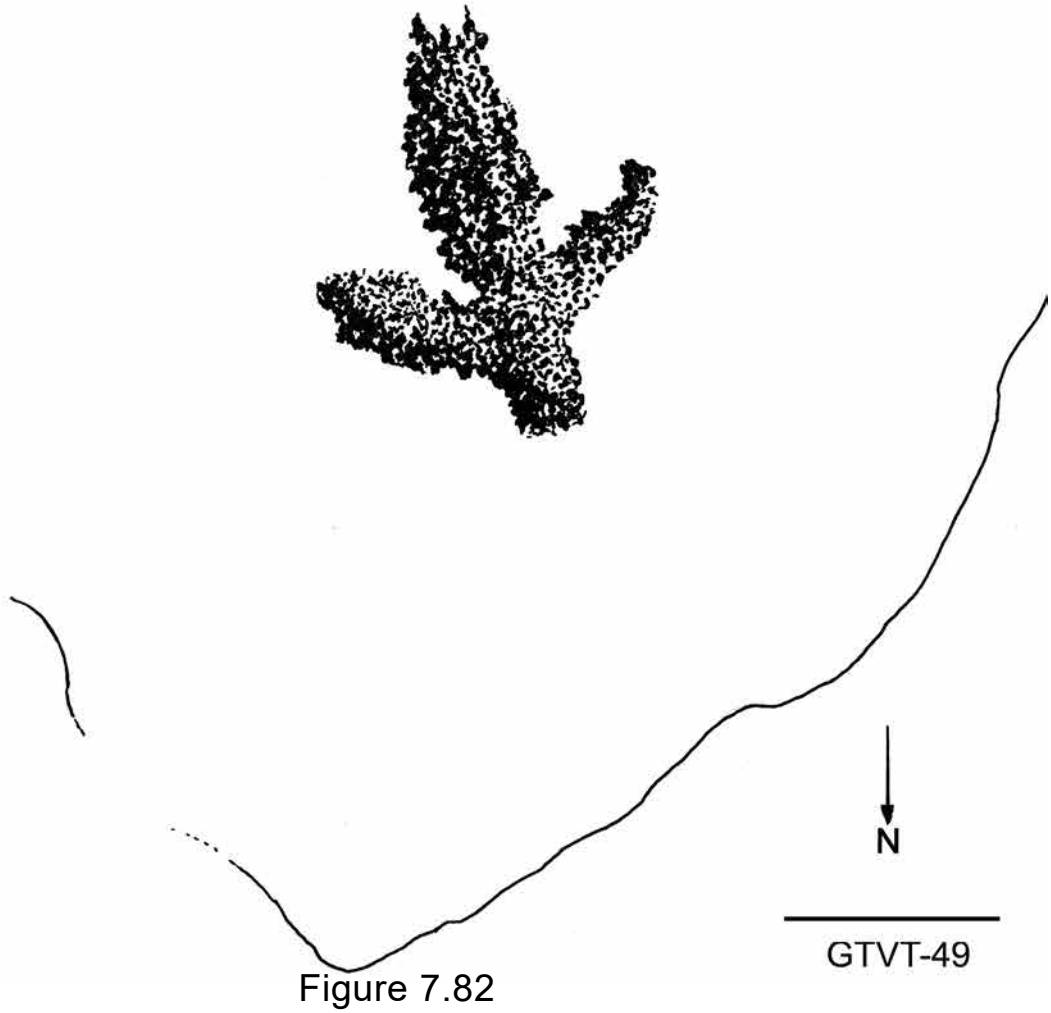


Figure 7.82

GTVT-50

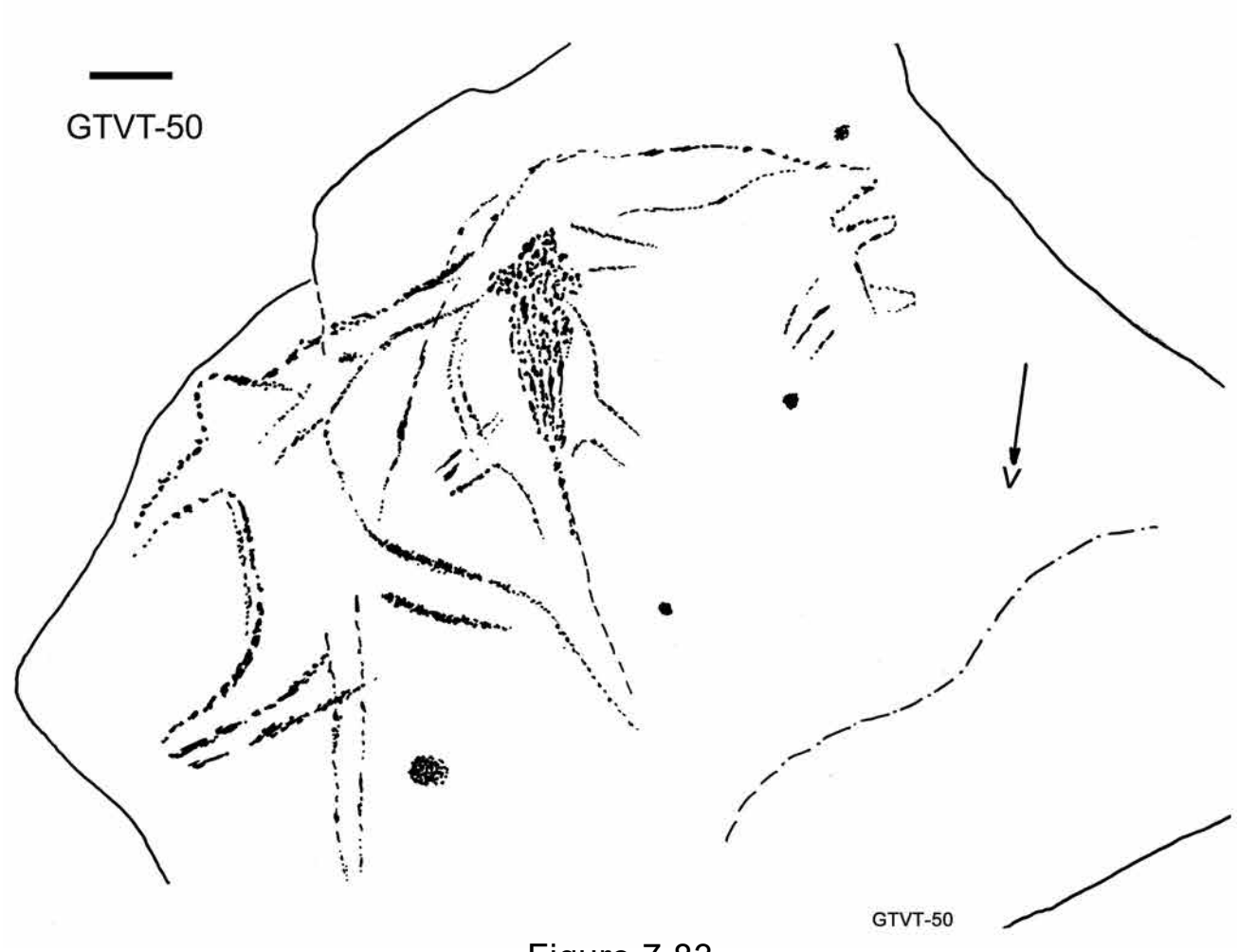


Figure 7.83

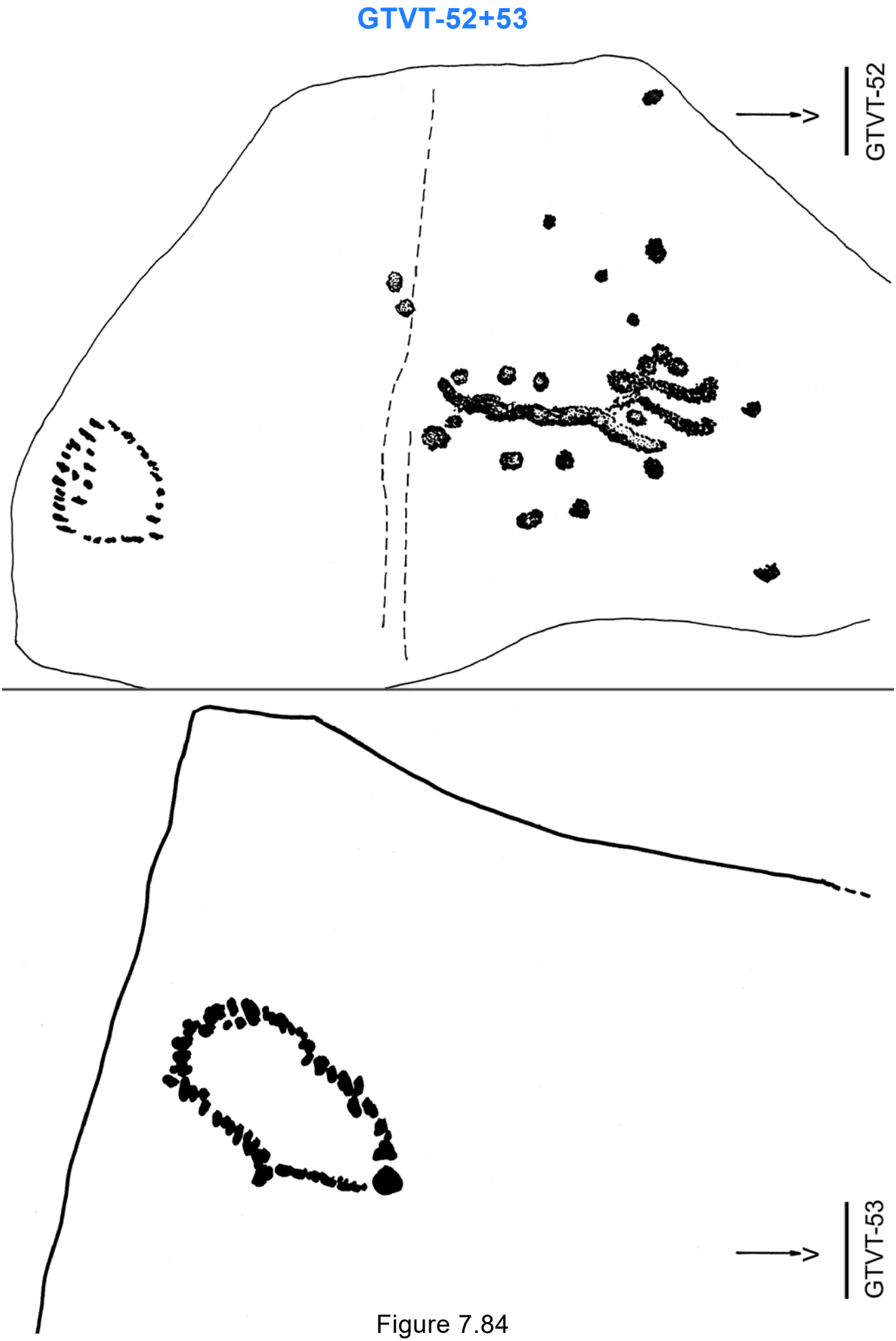


Figure 7.84

GTVT-55,56+58

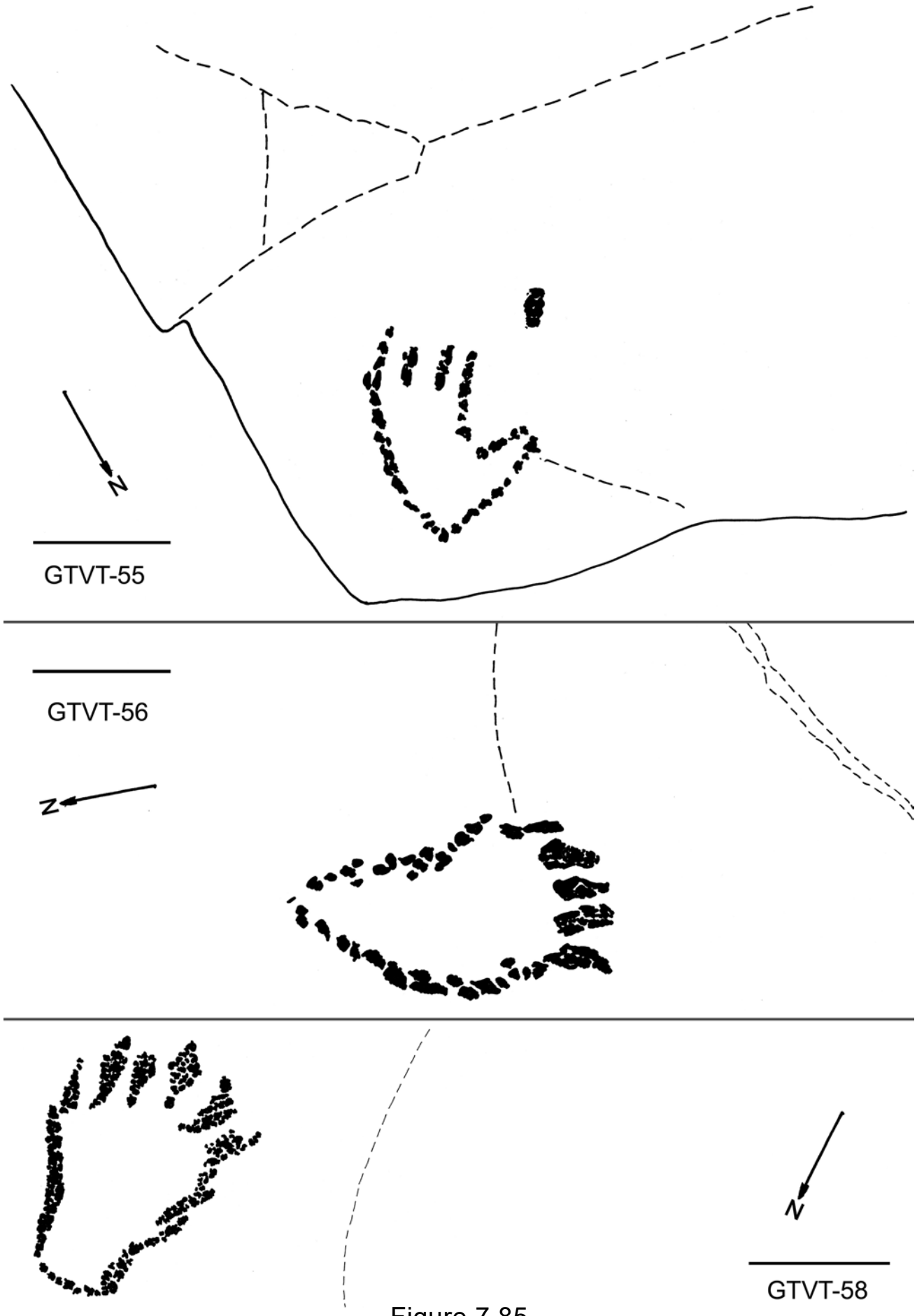


Figure 7.85

GTVT-57+59

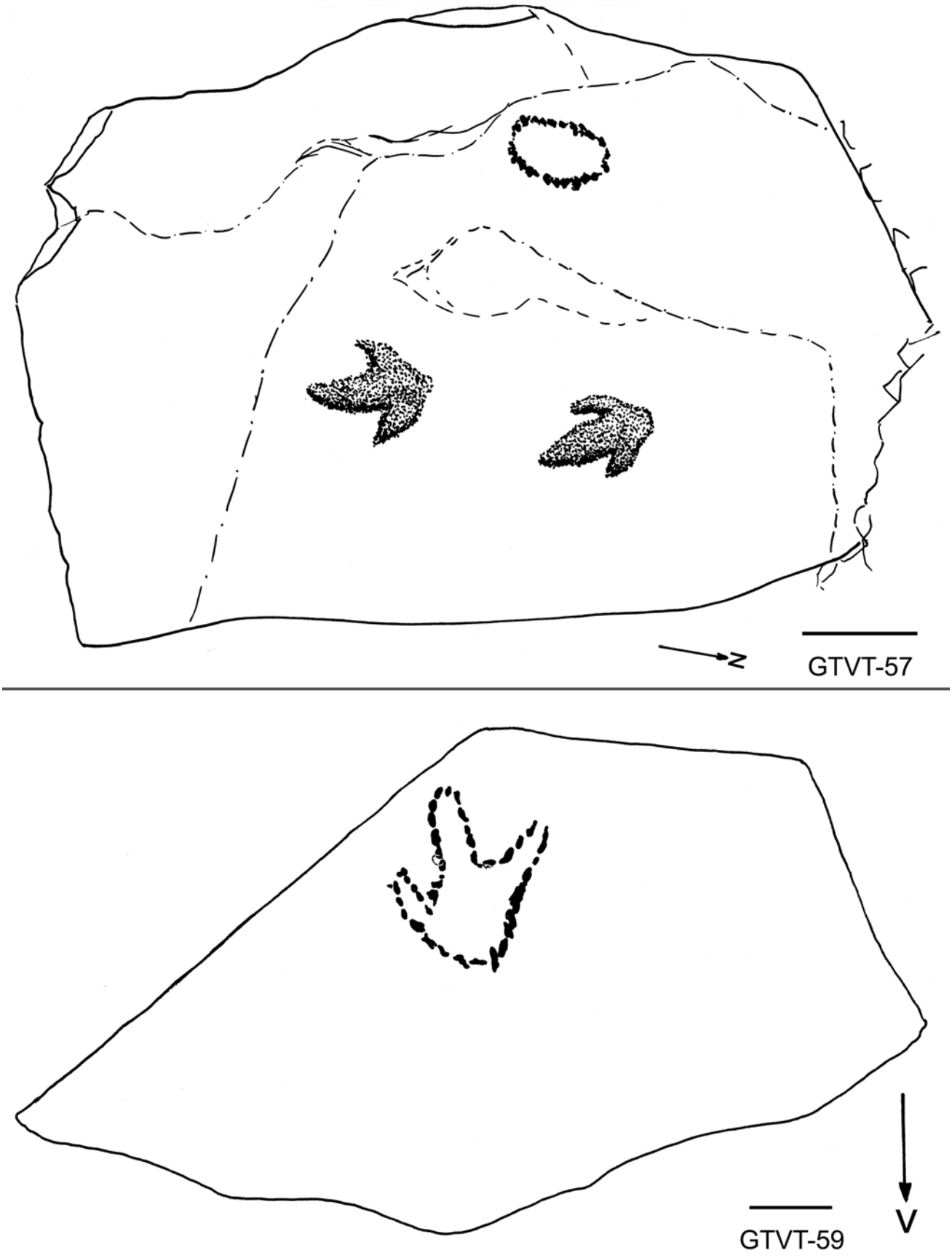


Figure 7.86

GTVT-60+61

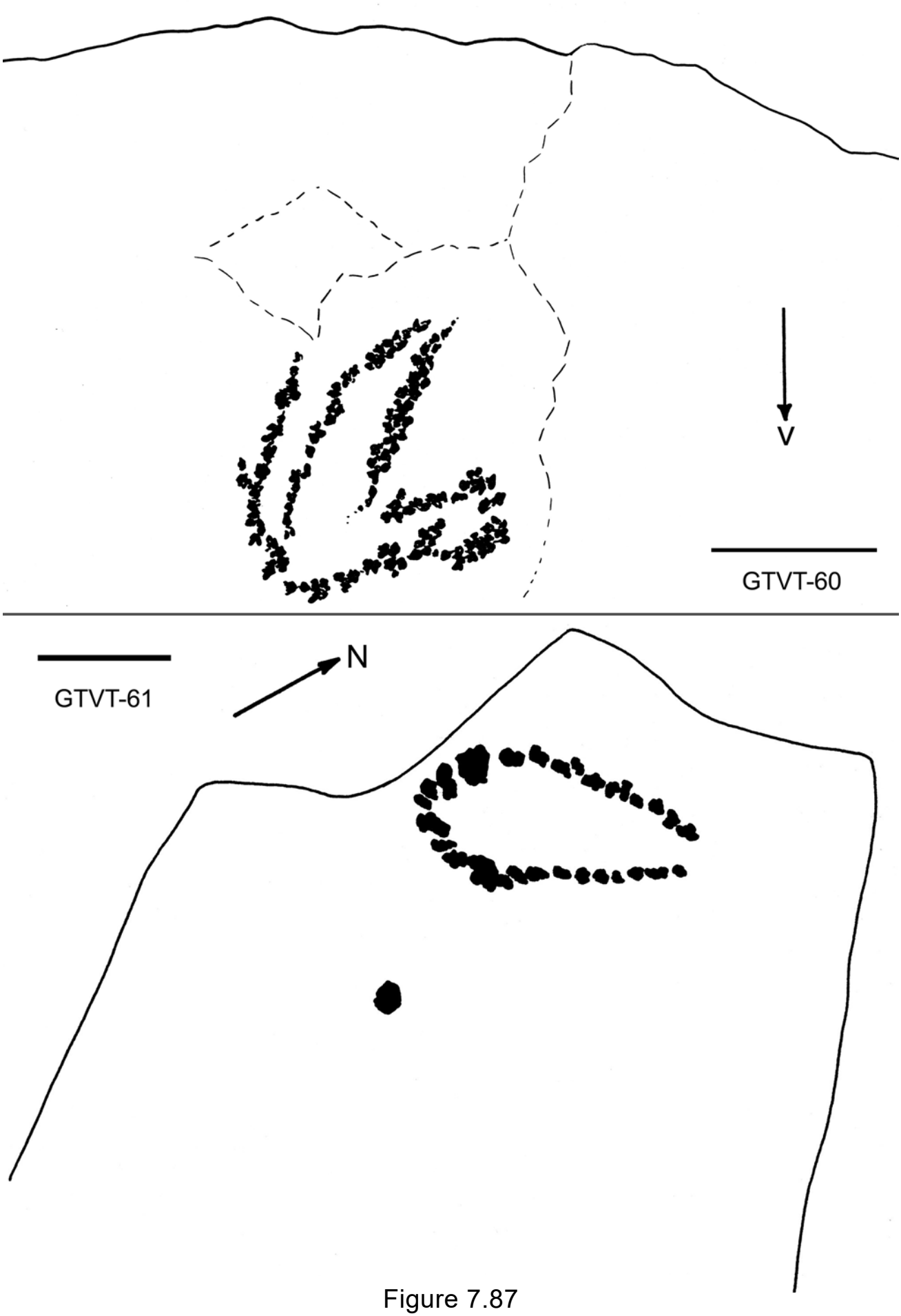


Figure 7.87

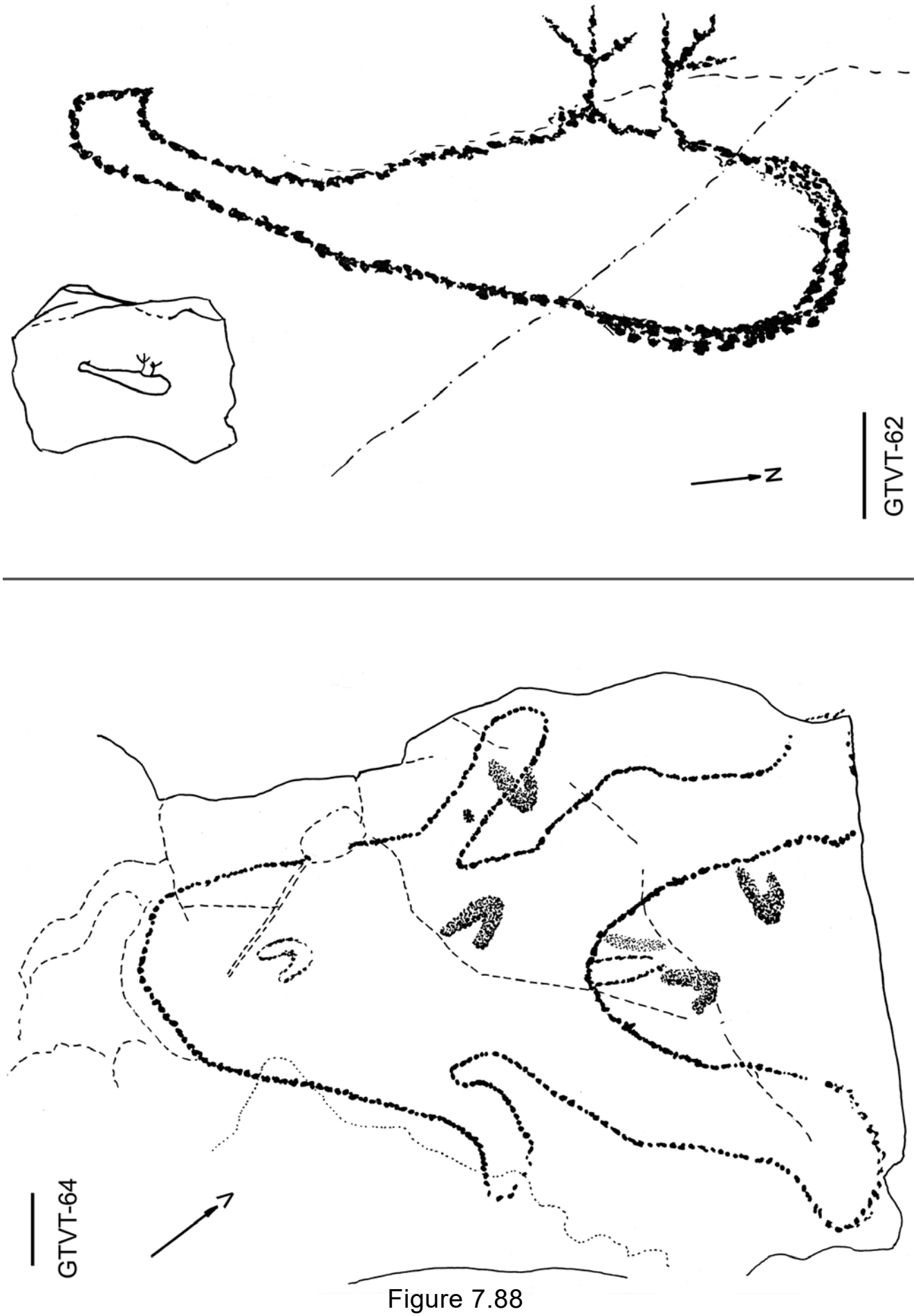
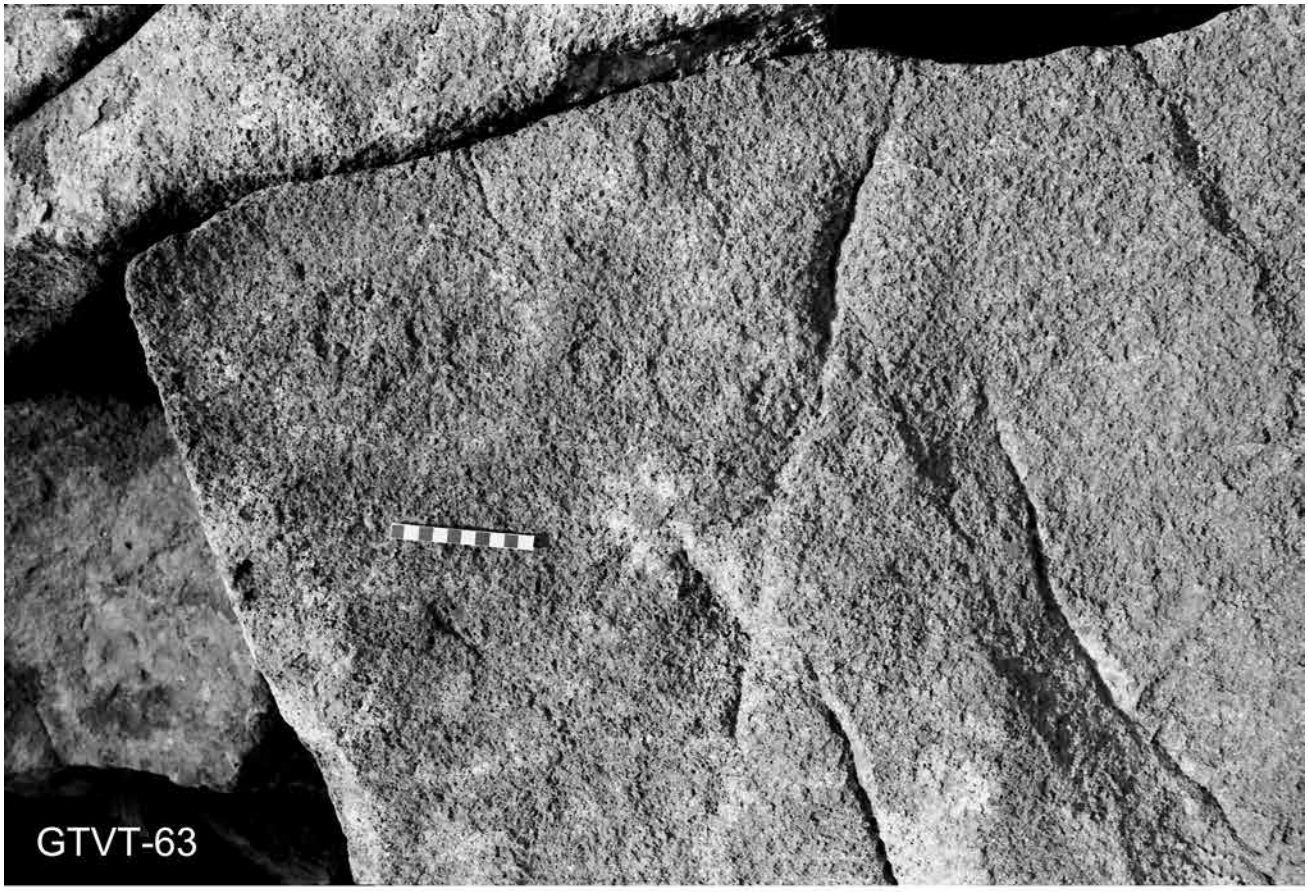


Figure 7.88

GTVT-63



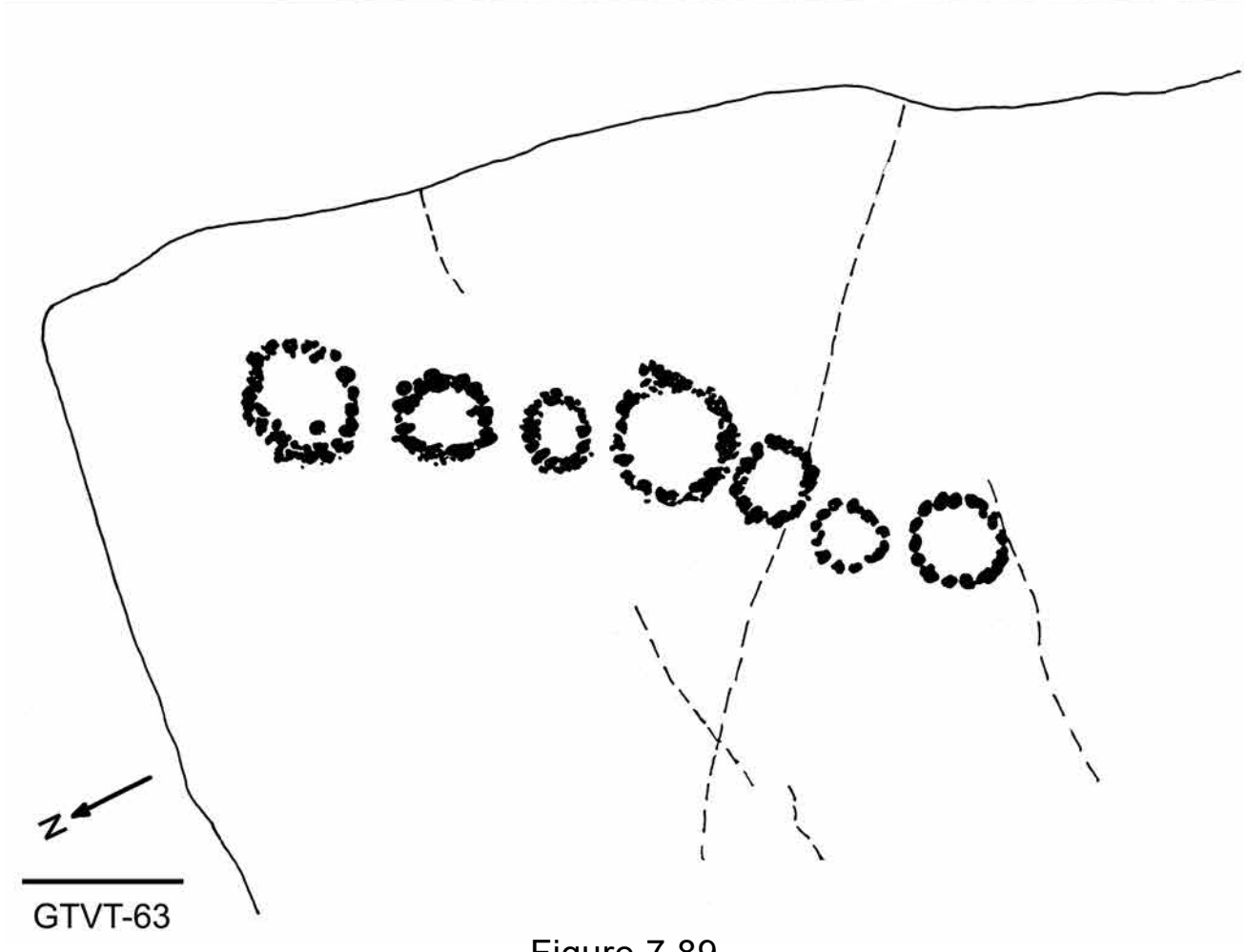
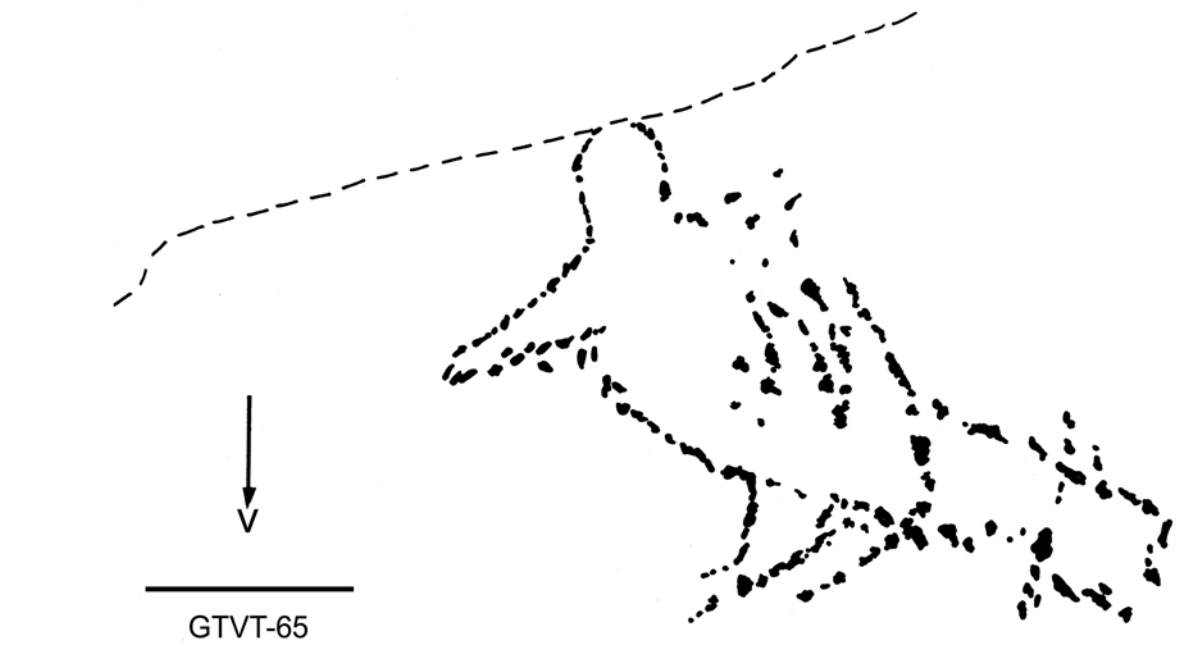


Figure 7.89

GTVT-65+66



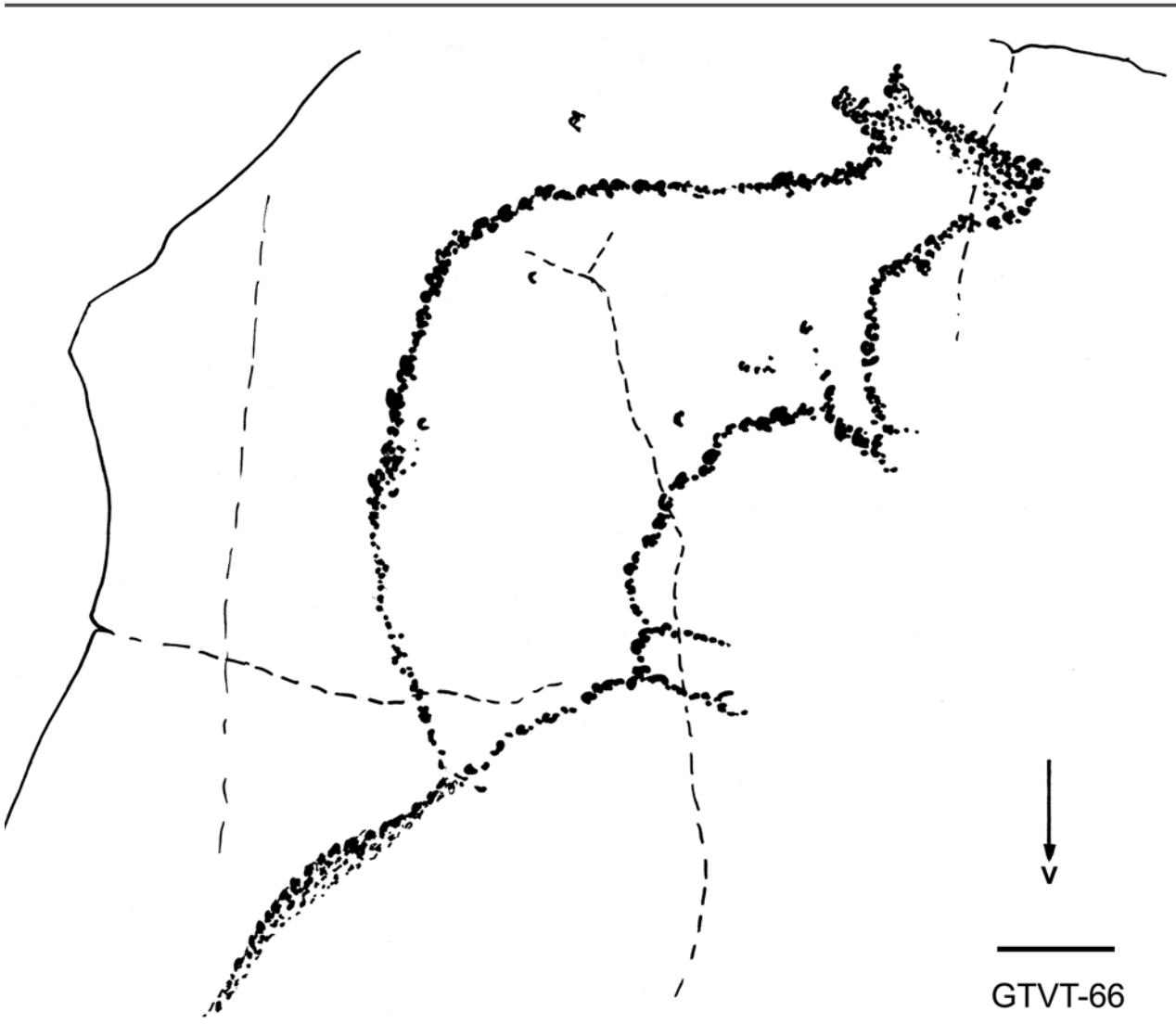


Figure 7.90

GTVT-68

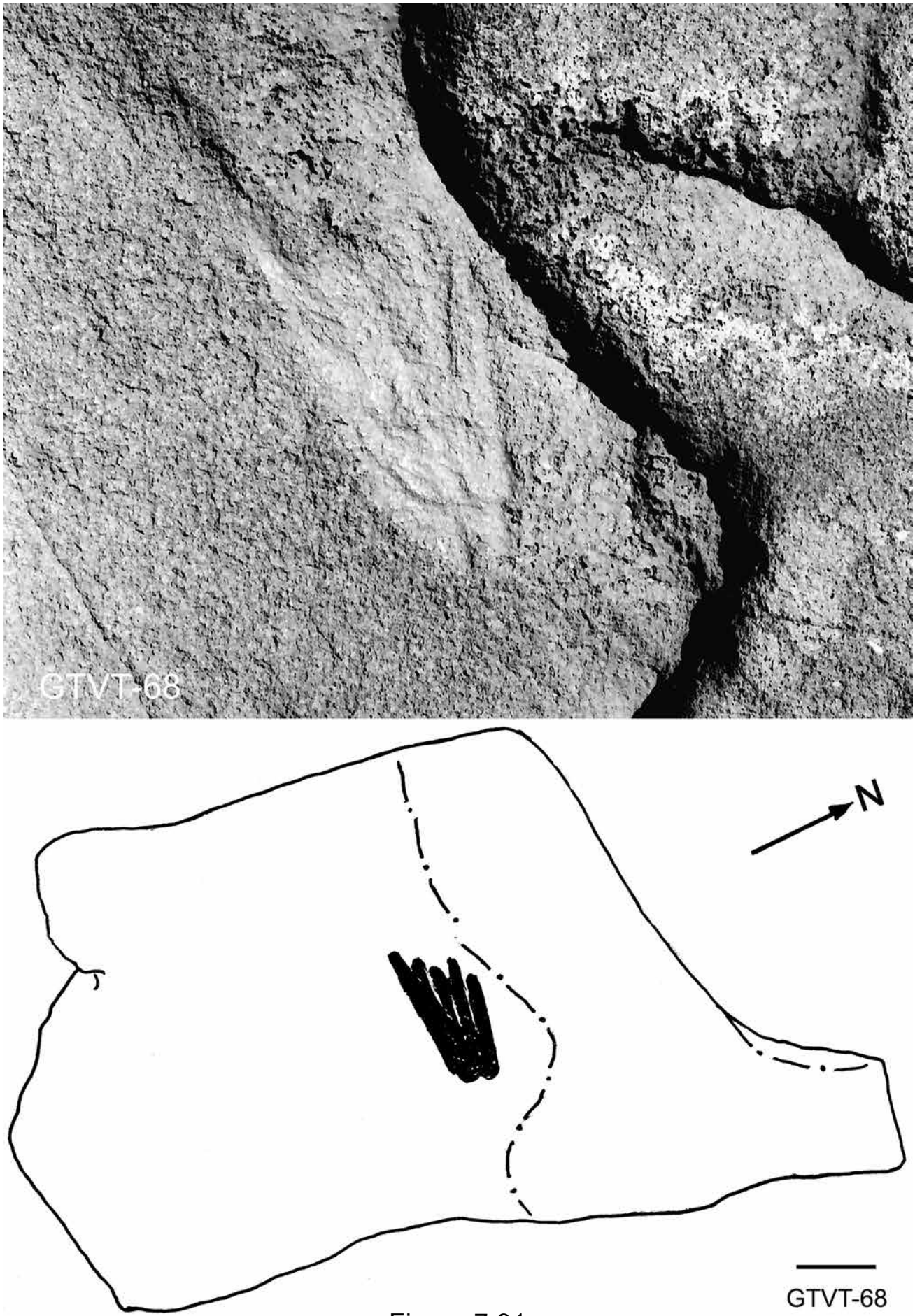


Figure 7.91

GTVT-69+72

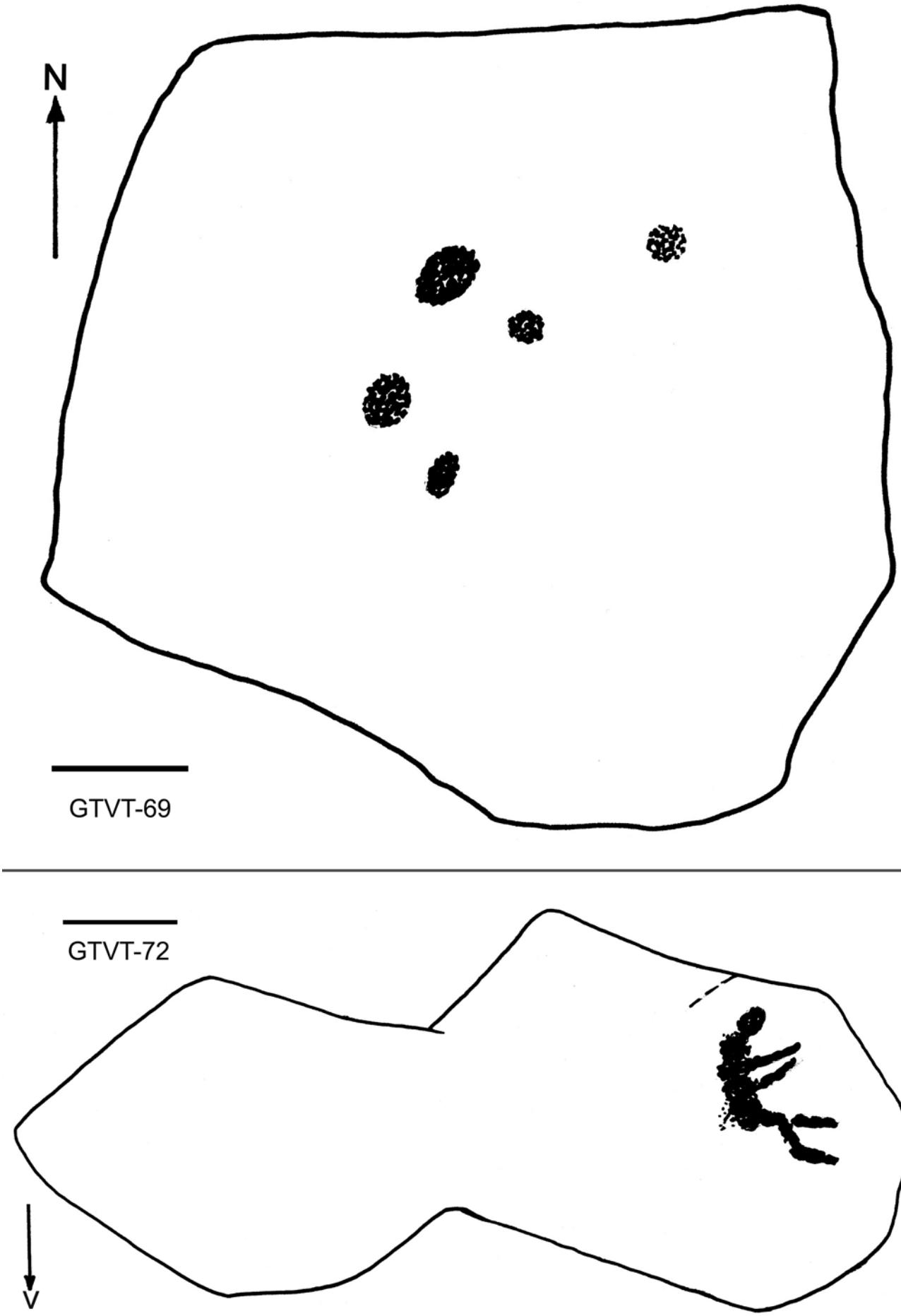


Figure 7.92

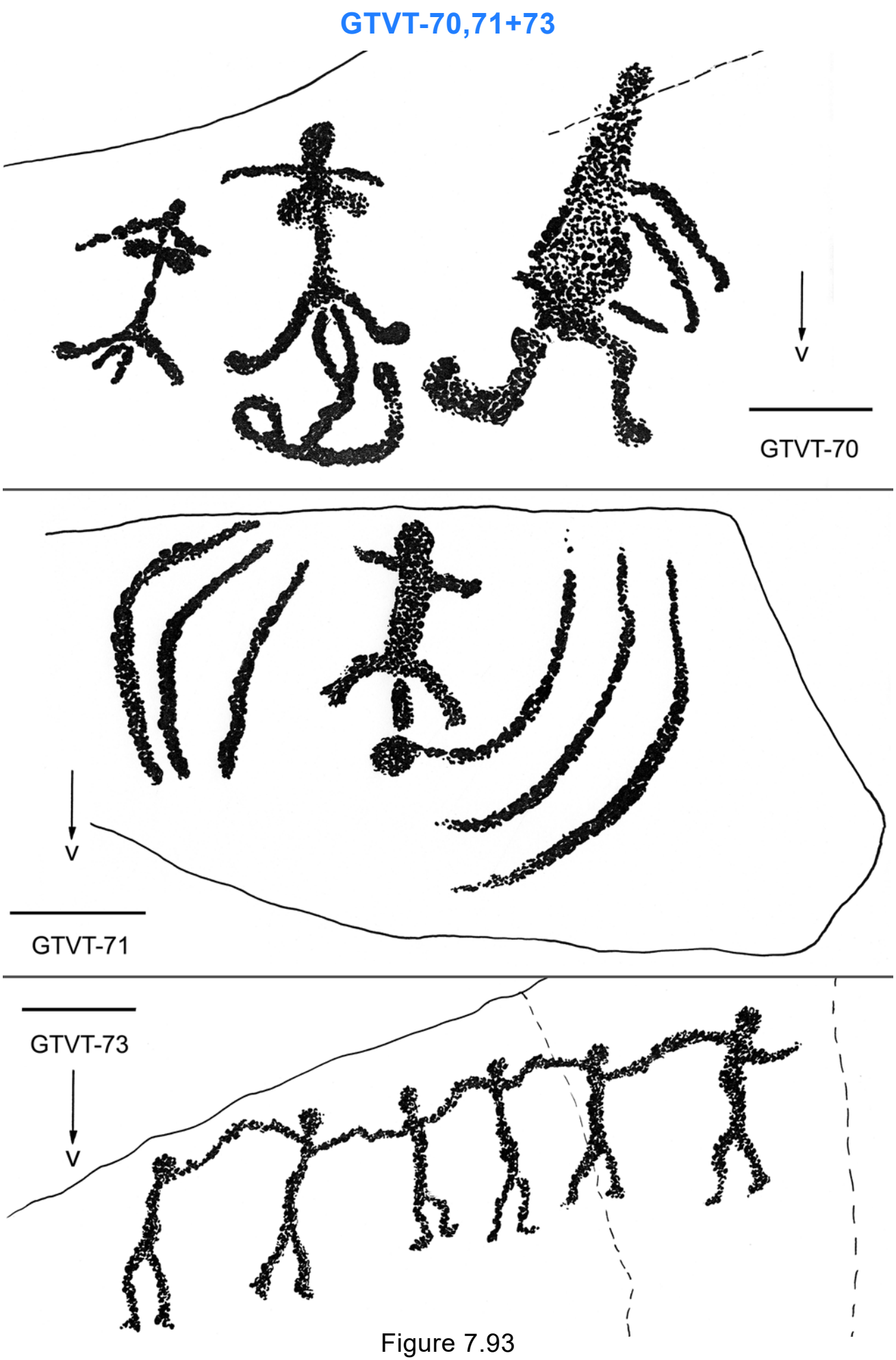


Figure 7.93

GTVT-74+78

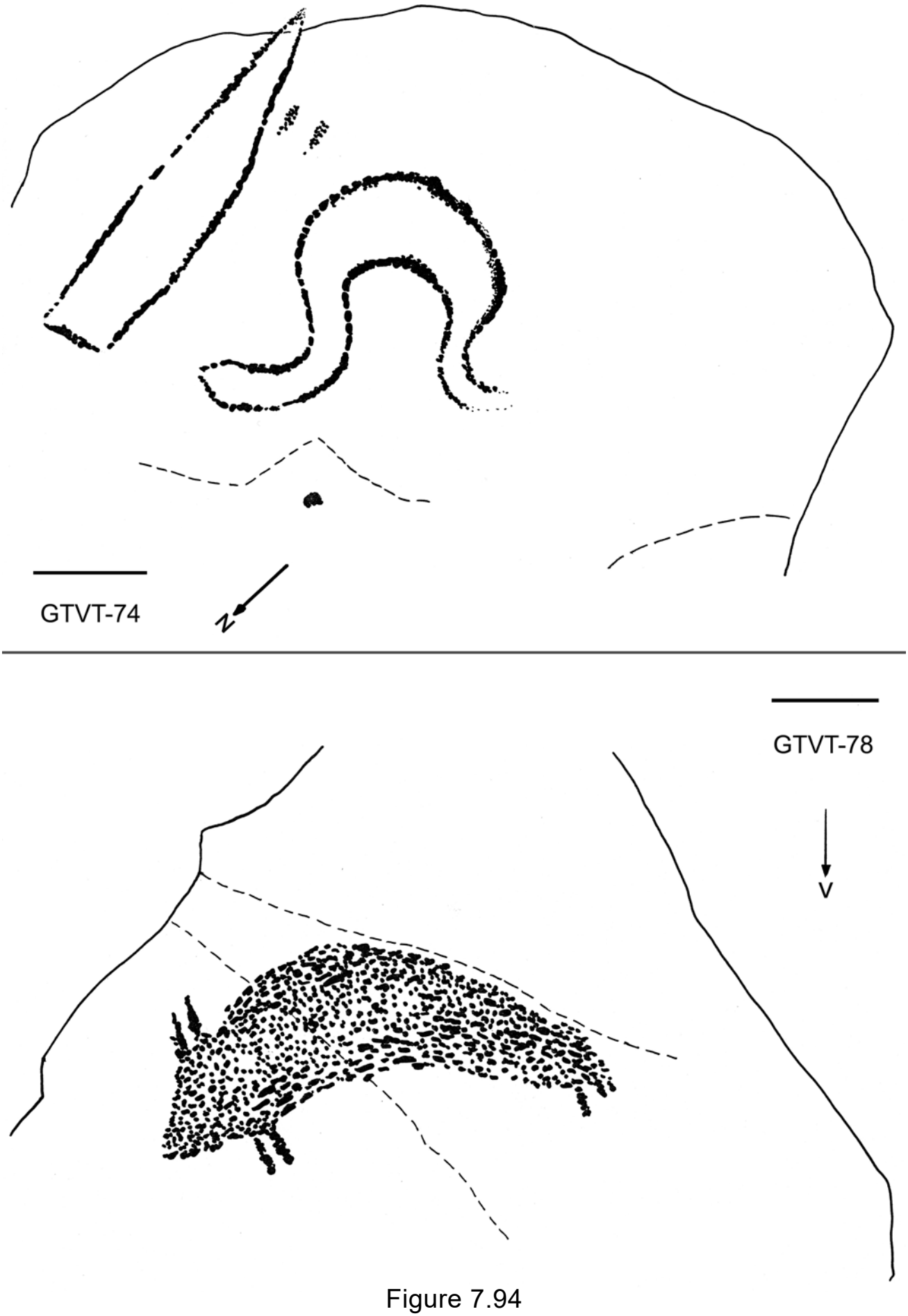


Figure 7.94

GTVT-75+76

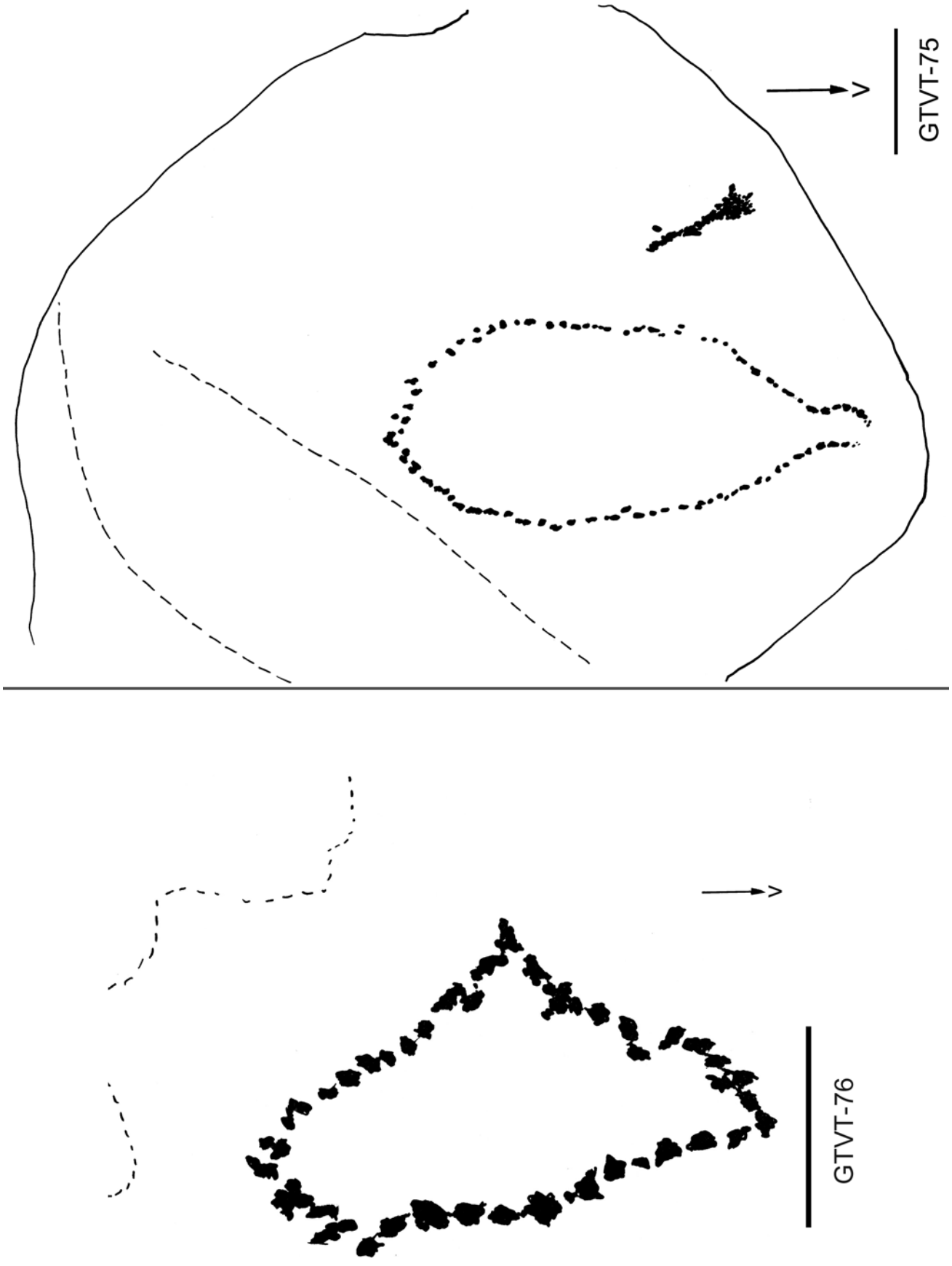


Figure 7.95

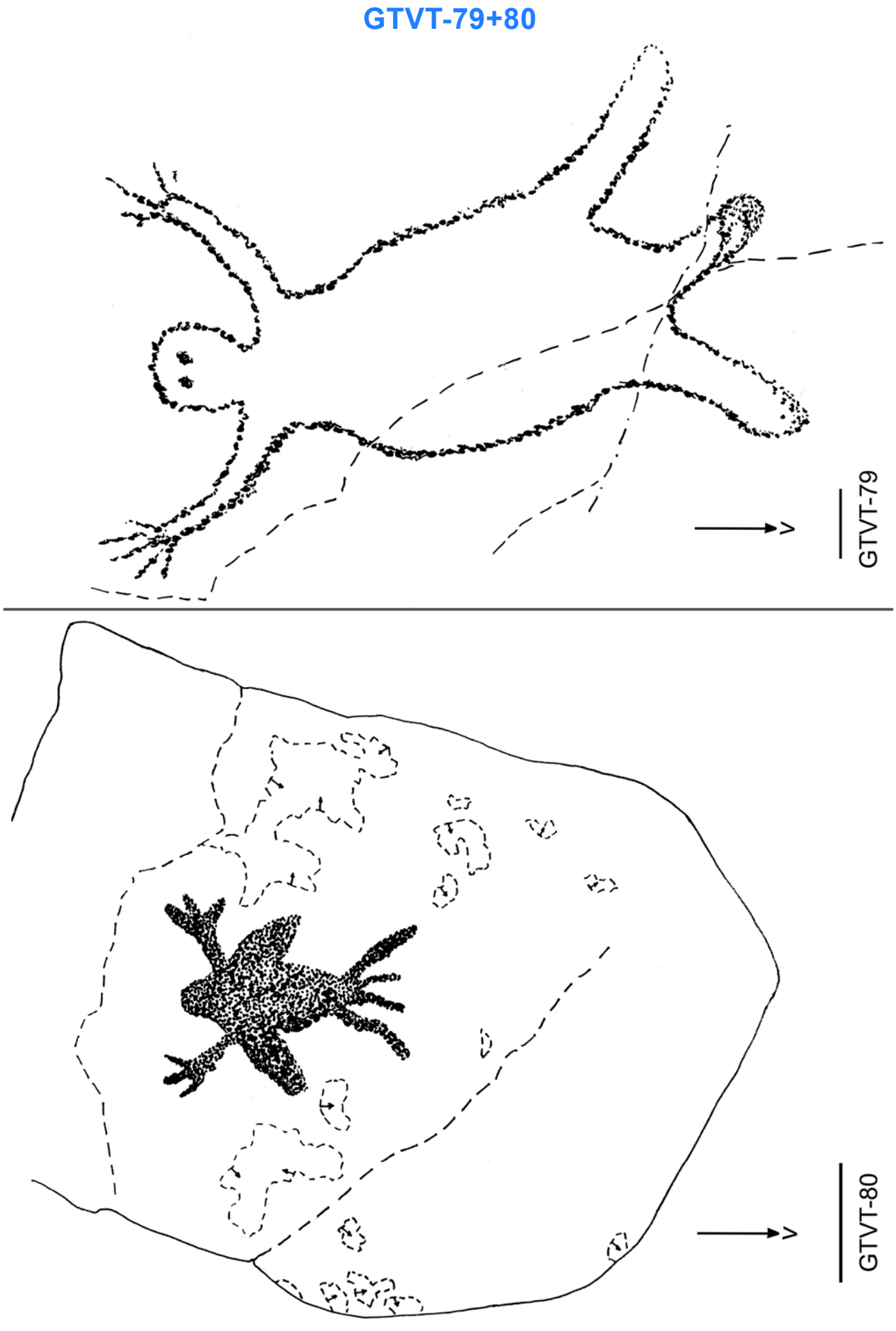


Figure 7.96

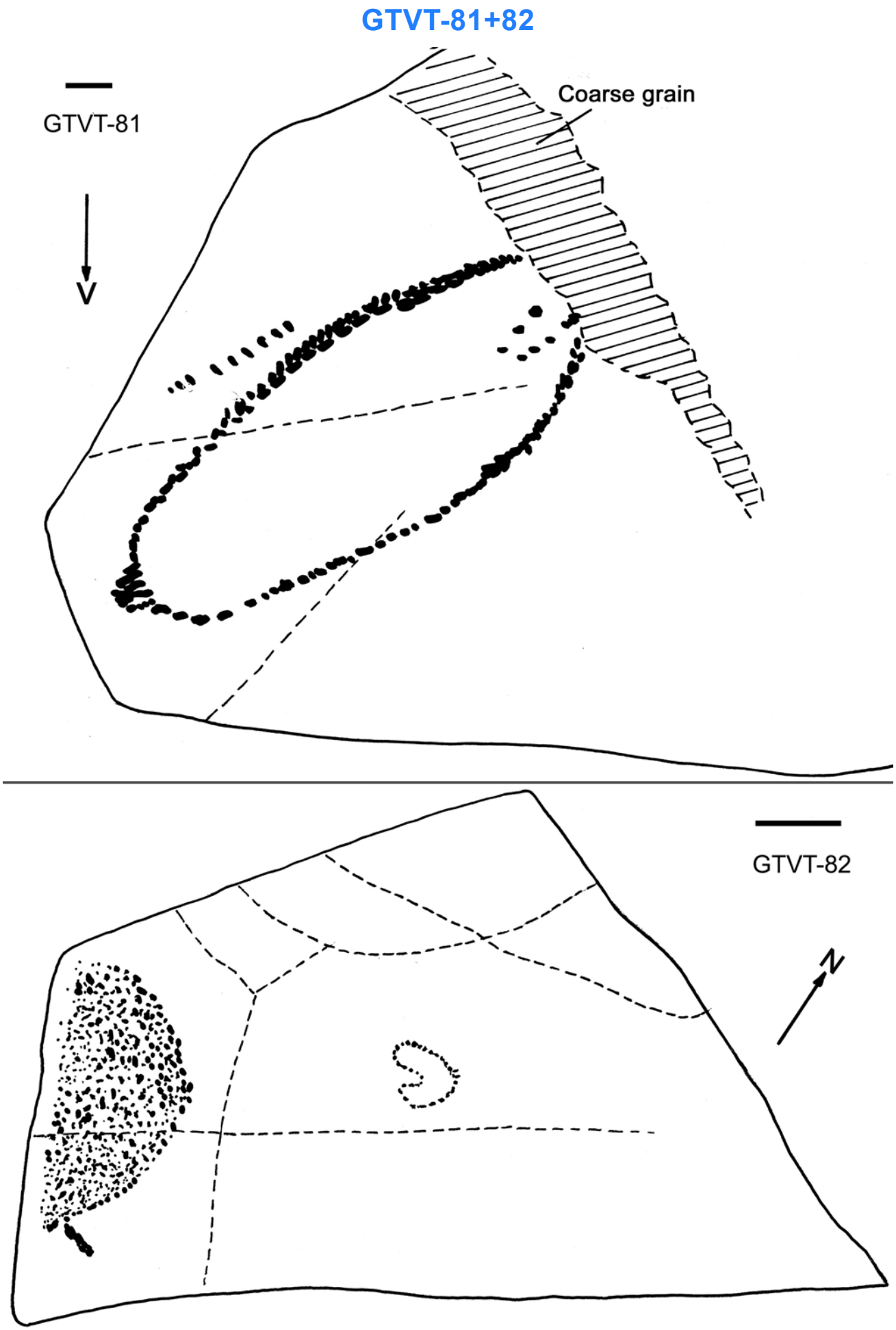


Figure 7.97

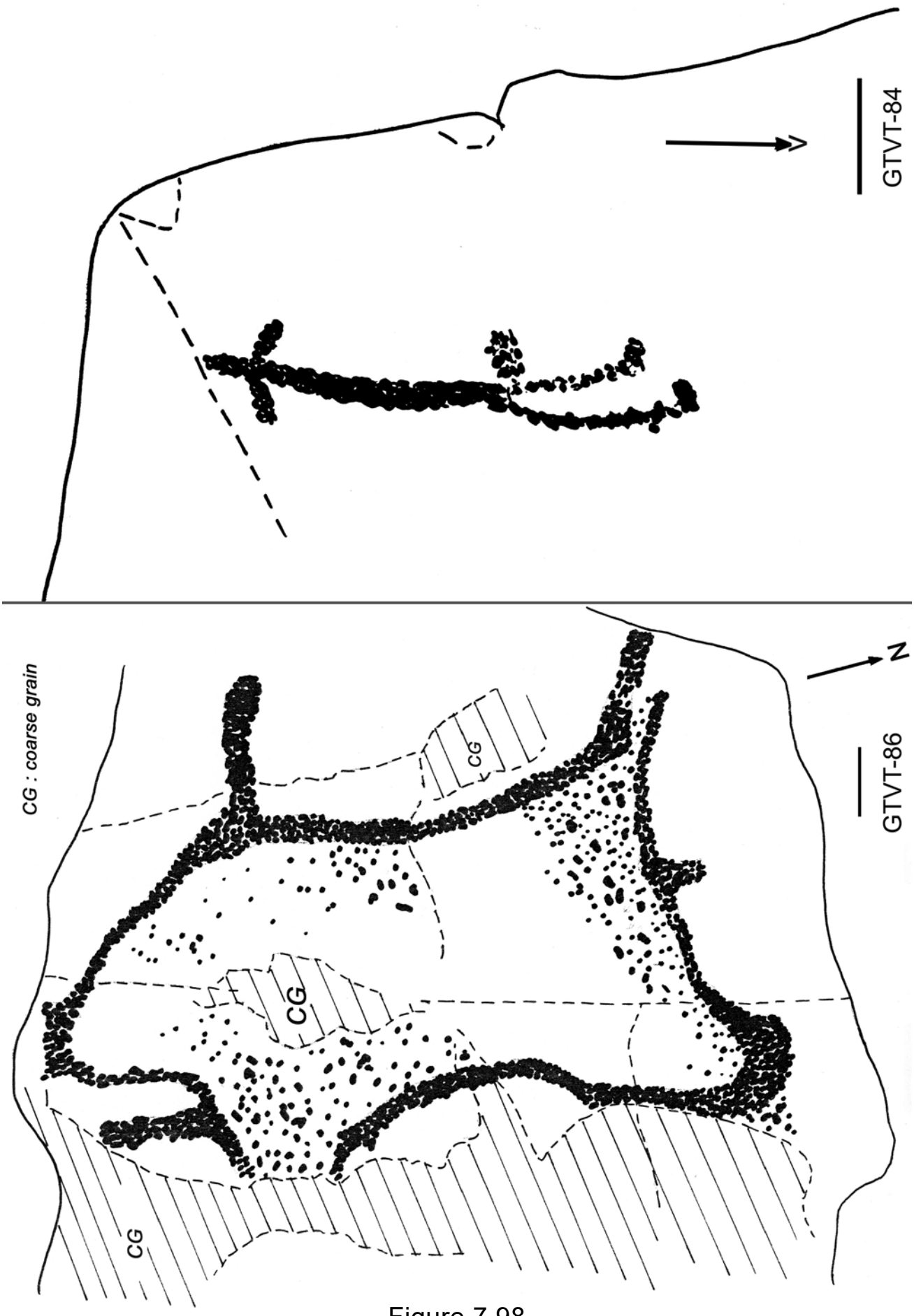


Figure 7.98

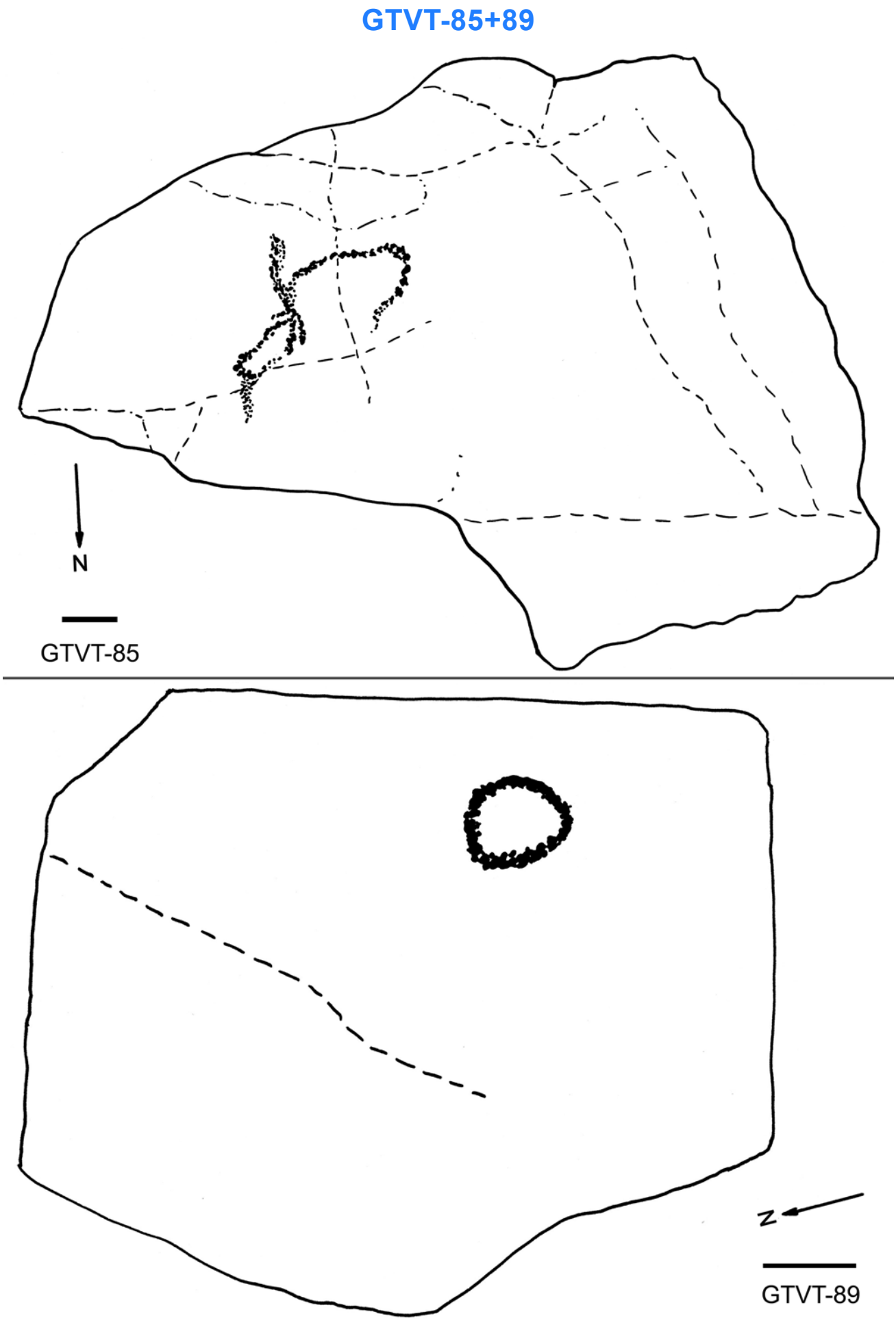
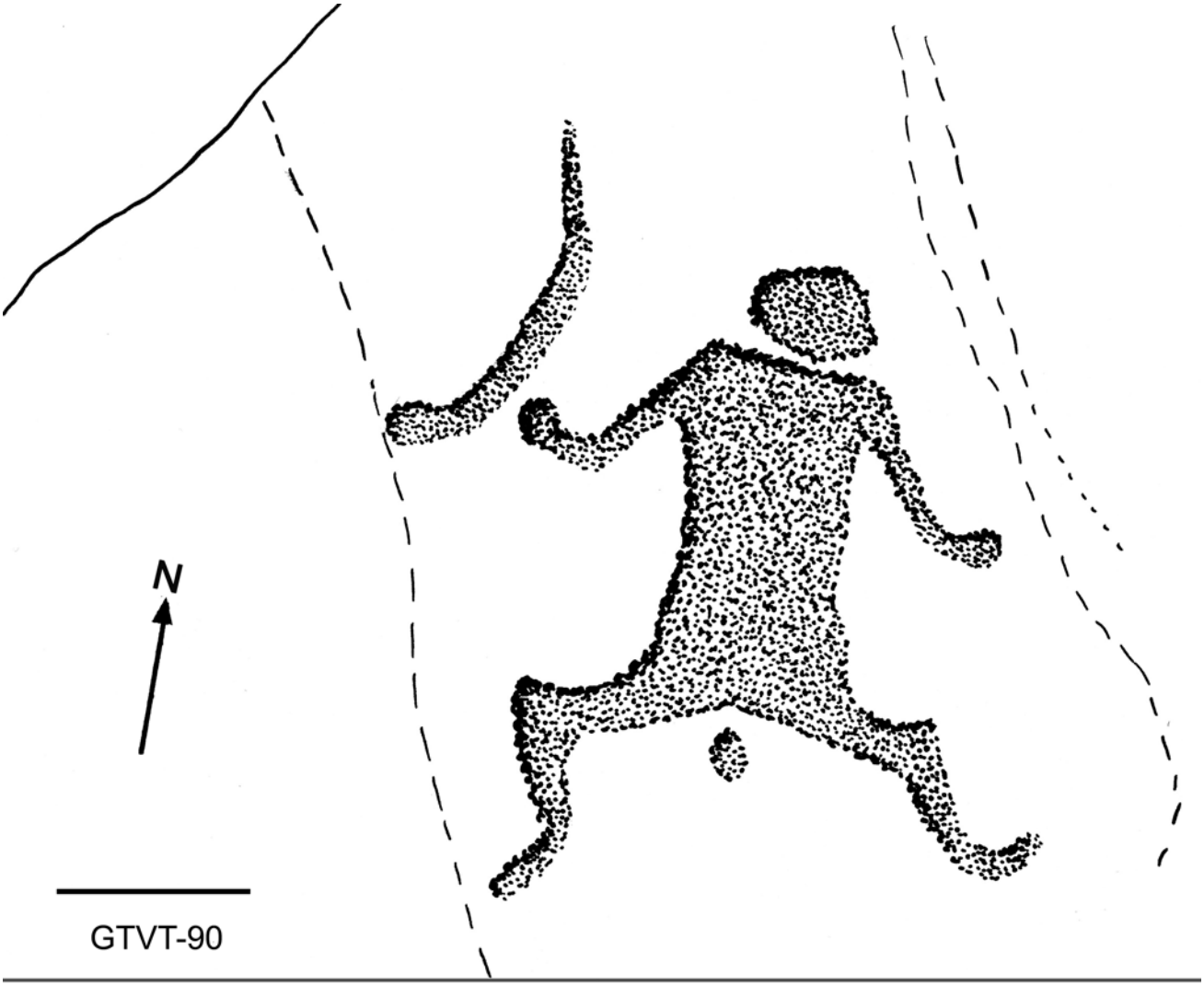


Figure 7.99

GTVT-90+91



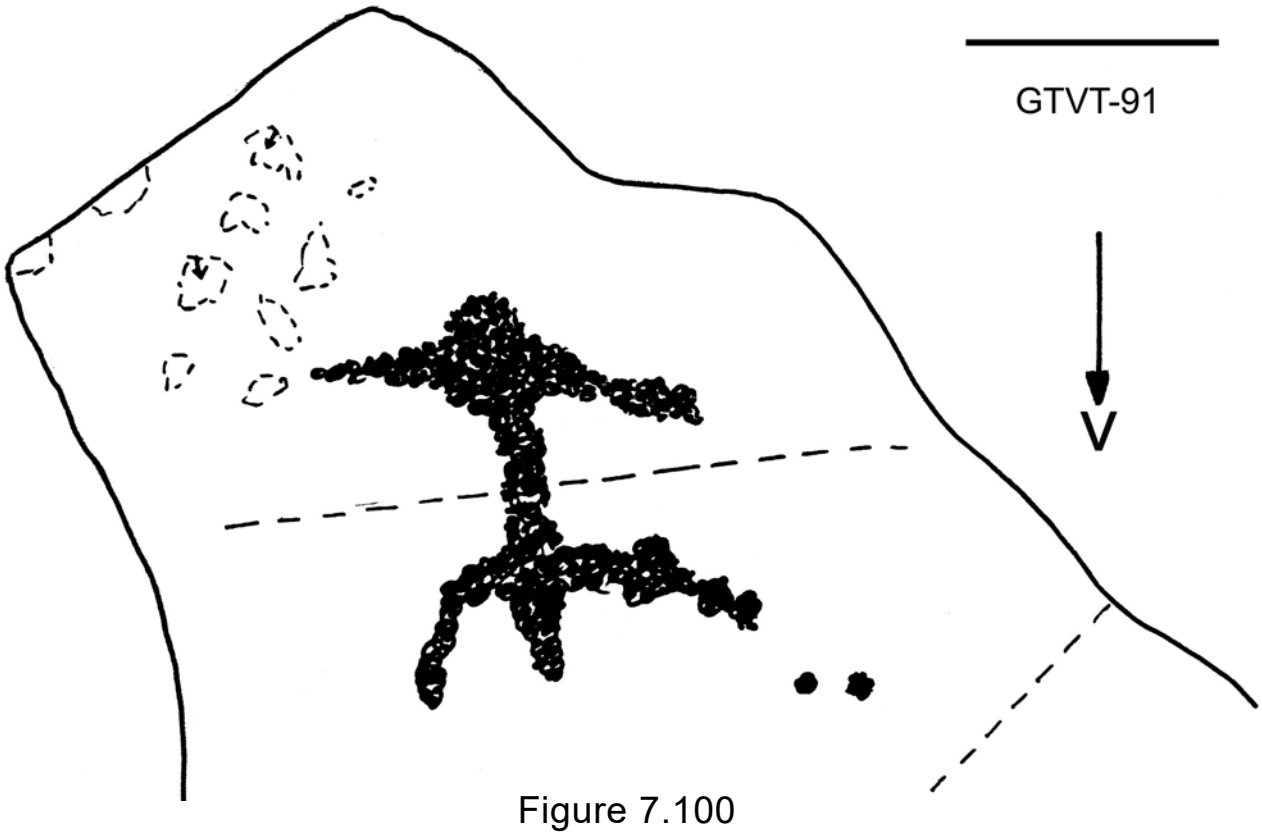


Figure 7.100

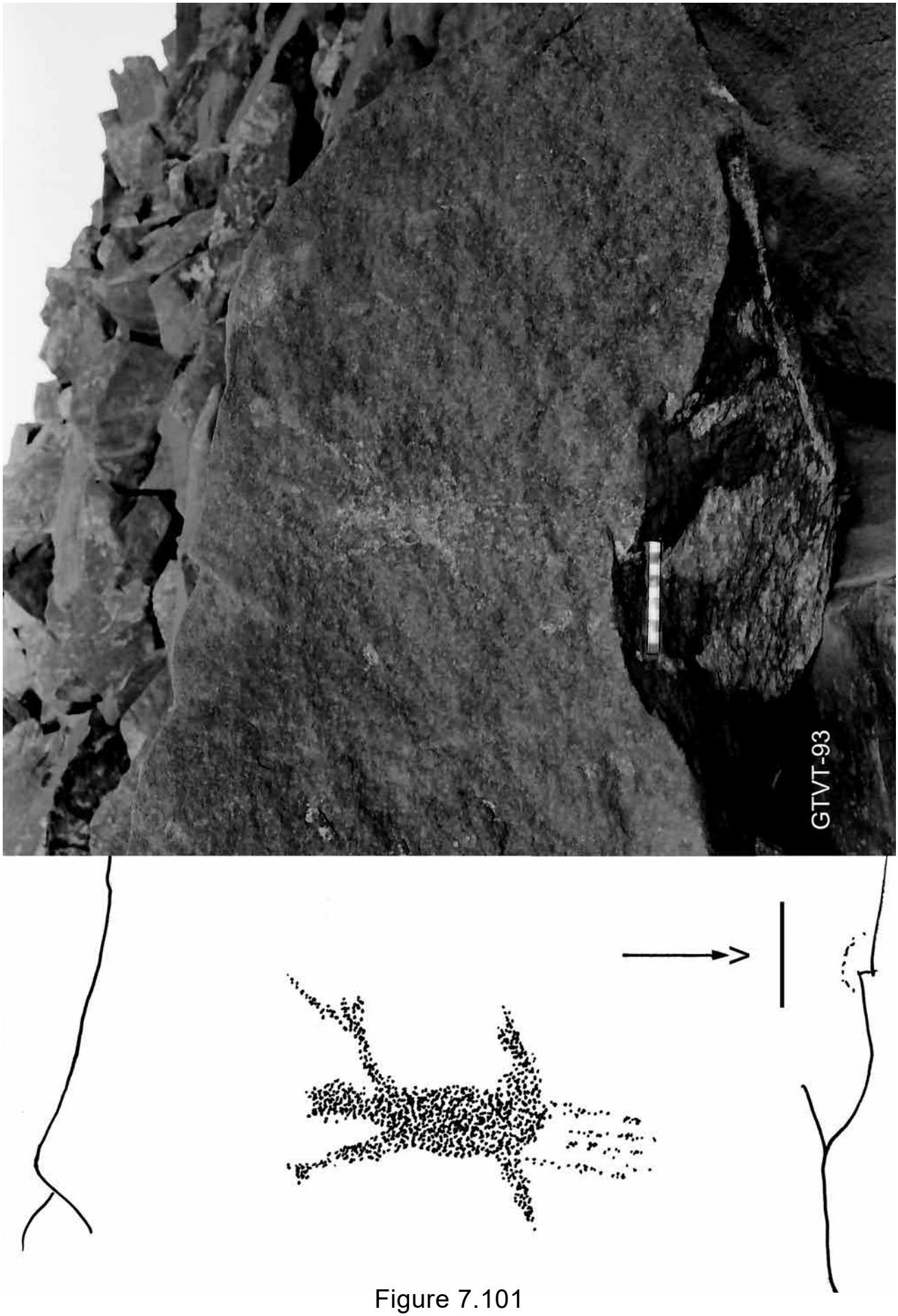


Figure 7.101

GTVT-94+97

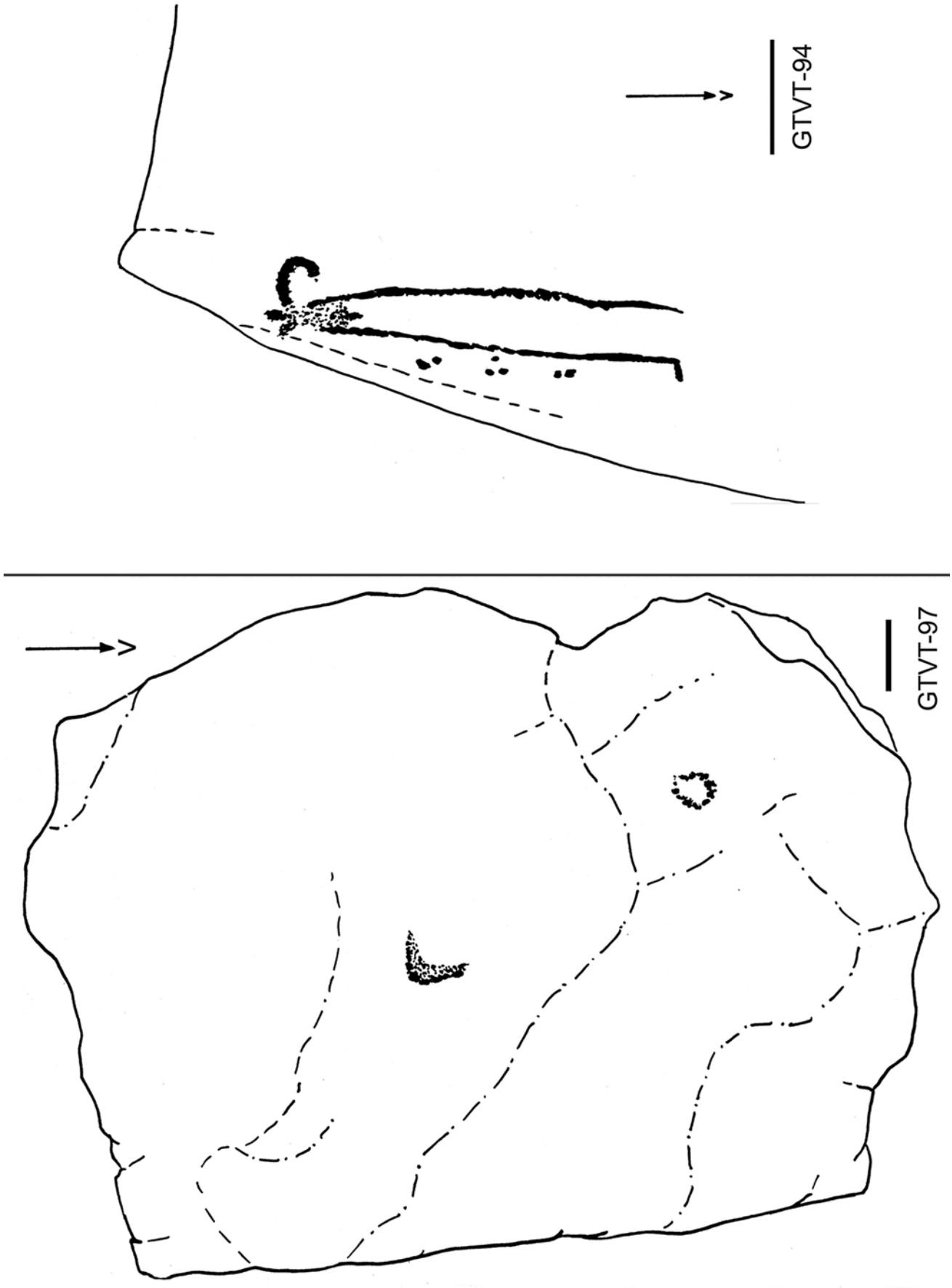


Figure 7.102

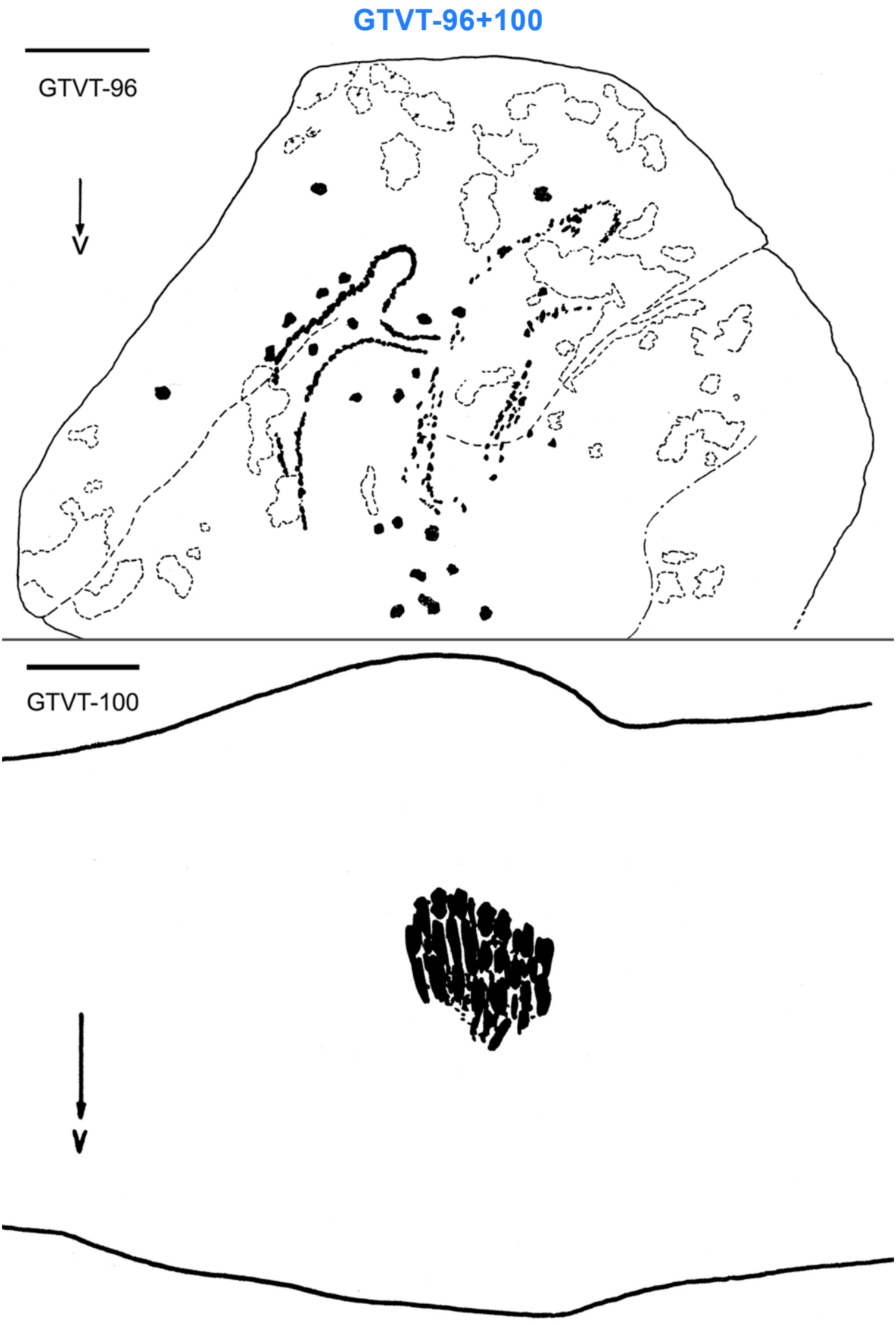


Figure 7.103

GTVT-101

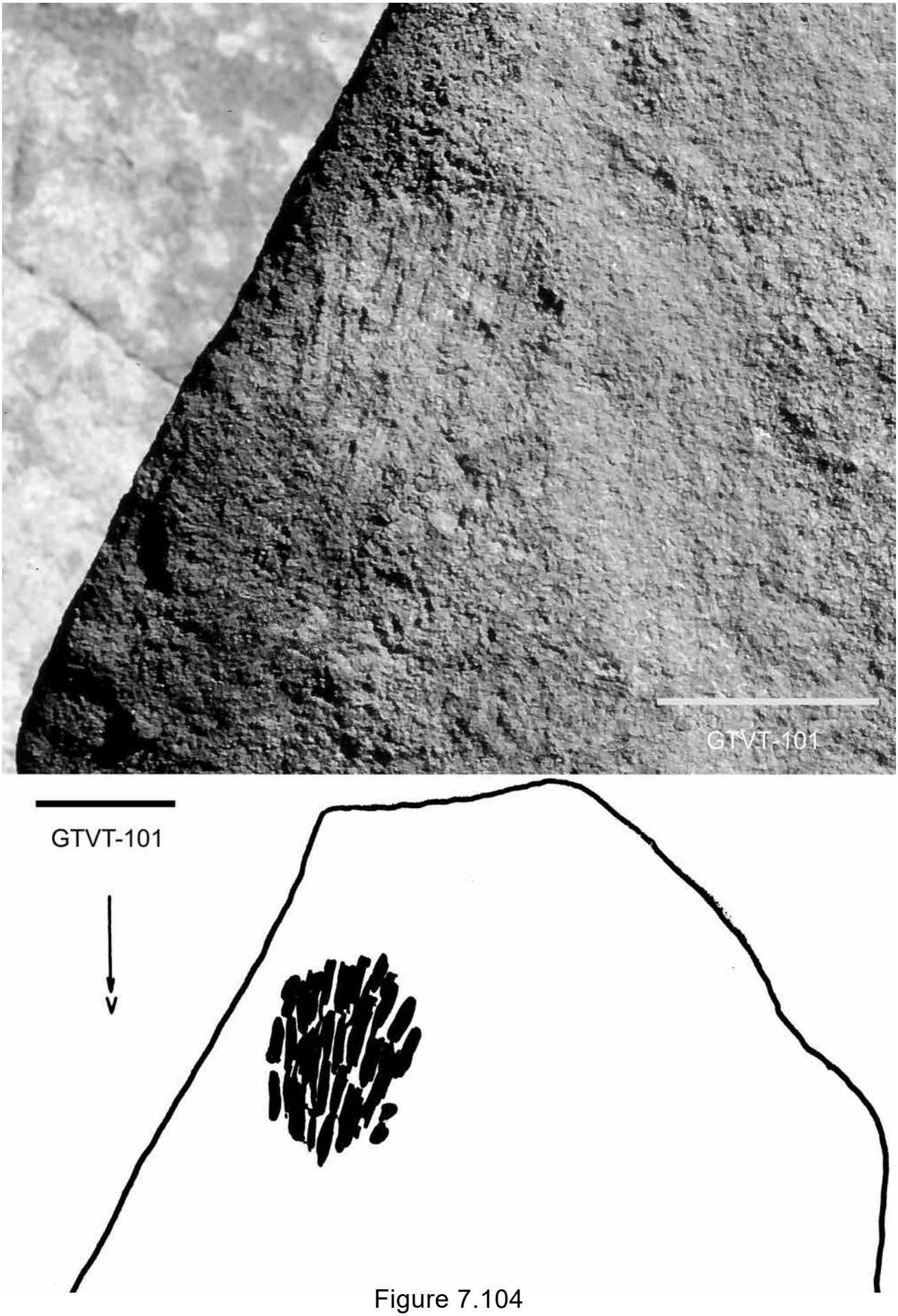


Figure 7.104