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Reprinted from

PROCEEDINGS OF THE BRITISH ACADEMY · 133

After Alexander
Central Asia before Islam

The Sasanian relief at Rag-i Bibi (Northern Afghanistan)

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I. The circumstances of discovery

Jonathan Lee

AFGHANISTAN REMAINS AT THE FRONTIER OF CENTRAL ASIAN ARCHAEOLOGY, a country which still throws up remarkable discoveries, forcing scholars to rethink prevailing historical presumptions. Despite twenty-five years of civil war, discoveries such as the Bactrian inscriptions of Tang-i Safedak and Rabatak, as well as other Bactrian and early Buddhist manuscripts, continue to appear. Remarkably, most of these discoveries are not the result of systematic archaeological surveys but are usually casual finds by villagers.

The rock carving at Rag-i Bibi, northern Afghanistan, which is the subject of this paper, is a further example of such 'casual' finds (Pl. 6). Indeed, were it not for a series of coincidences the carving would still not be known to foreign scholars. My first intimation of the existence of this carving came in December 2002 when the British Museum held an Afghanistan day. At the time I had recently returned from an expedition to Yakaulang, Central Afghanistan, to recover the Bactrian inscription of Tang-i Safedak. The conveners of the conference kindly allowed me a ten minute 'slot' at the end of the morning's proceedings to report on the discovery. An Afghan journalist, Najibullah Razaq, who was in the audience, later approached me and showed me video footage of the site which he and a BBC correspondent had visited earlier in 2002. Mr Razaq later forwarded additional photographs which showed a horse with rider at the gallop and a number of standing or mounted attendants. From the attendants' clothing, it appeared that the carving was Kushan or Kushano-Sasanian.

¹ François Ory is a draughtsman and Dr Philippe Martinez is an archaeologist and computer engineer, both at the CNRS (UMR 8546).

In the event it was not until December 2003 that I visited the site. Even then, it was but a brief visit and in the middle of a snow storm. Accompanied by Mr Razaq's contact in Pul-i Khumri, Mr Badroz, my wife and I drove to the village of Shamarq and, with local people as guides, clambered up the narrow and treacherous mountain path to the ledge where the carving is located. Despite the bad weather we managed to take reasonable photographs of the carving. First hand inspection more than confirmed the importance of the discovery. On my return to Kabul photographs of the site were sent to Frantz Grenet with suggestions of a joint publication with commentaries made on the basis of the photographs. Professor Grenet, however, deemed the discovery to be sufficiently important to mount an expedition to the site, which took place on 20–27 May 2004.²

During this expedition, further facts emerged regarding the original discovery. Shortly after the end of Taliban rule in Baghlan at the end of 2001, some villagers from Shamarq, concerned about the fate of a cherished local landmark, asked Baghlan's Department of Information and Culture for help protecting the site. The villagers reported that towards the end of Taliban rule, Talib militiamen guarding the main Pul-i Khumri to Doshi road had been informed by local sympathizers of the existence in the adjacent mountain of idols (*bot*) which local people were 'worshipping'. As a result, some Talibs visited the site and, finding that there were human figures there, tried to deface the relief.

The Taliban managed to break off a sizeable section of rock on the extreme right hand side of the relief. This section now lies in the valley below, face down. Fortunately, it appears not to have been carved but merely roughly dressed with a chisel. The lack of patina on the front leg of the rhinoceros (extreme right) (Fig. 2) and on the broken neck of the first rider following the king (Fig. 9) suggest that this damage was also inflicted by the Talib iconoclasts. Fortunately, a few days after the vandalism took place the Taliban fled, thus putting a halt to further attempts to destroy the site.

Following the reports of the villagers, Mr Ahrah, head of Baghlan's Department of Information and Culture, and Mr Tokhi, the individual responsible for the preservation of the province's historic monuments, visited the site in early 2002. The Department then wrote an official report regarding the discovery to the Minister for Information and Culture in Kabul. Baghlan, unlike many other provincial centres, had placed itself

² The mission of May 2004 was a joint venture of SPACH and DAFA. Funds were provided by the French Ministry of Foreign Affairs and the Ecole Normale Supérieure (Paris). Dr Raheen, Minister of Information in the Interim Government of Afghanistan, kindly provided official letters in support of the mission. The mission was accompanied by Mr Andarabi, an official representative of the Institute of Archaeology, and Mr Ahrah and Mr Tokhi of the Baghlan Department of Information and Culture. The people of Shamarq welcomed us warmly and through their efforts the path to the site was widened and a number of them portered heavy equipment up the mountainside on a daily basis. ACTED kindly provided the mission with accommodation, the use of a vehicle and driver and much good advice during our stay in Pul-i Khumri. Thanks are also due to the Swedish Committee for Afghanistan for the hire of car and driver in December 2003.

under the authority of the new government and continued to be active in preserving and protecting archaeological sites and monuments in the province.

In May 2002, Mr Tokhi attended a UNESCO conference in Kabul and submitted a further official report to a UNESCO representative. Despite these reports, no action was taken to record the site scientifically. Had it not been for the photographs shown me by Mr Razaq in December 2002, the Rag-i Bibi carving might still be a site of just local curiosity. Regrettably, between my visits in December 2003 and May 2004, further damage had been done to the site. A scour mark on the breast of the horse and the standing figure to the rear, is the result of a ladder being placed against the carving. There is also recent graffiti chalked on the upper left hand side.

The rock carving is known locally as Rag-i Bibi and is situated a kilometre south of the village of Shamarq (Fig. 1). Shamarq lies 10 km south of Pul-i Khumri, west of the unpaved road and on the left (west) bank of the Pul-i Khumri river. The carving faces due east and is situated in the rock wall 105 m above the valley floor at an altitude of 871 m (GPS reading: 35° 53' 10.8" 10.8" N; 68° 44' 54.8" E). The carving is 6.5 m wide and 4.9 m high and is located in a prepared niche. Access is by a steep ascent and then along a narrow goat path.

Rag-i Bibi, or 'Veins of the Lady', is said by local sources to refer to Bibi Fatima, daughter of Muhammad and wife of 'Ali b. 'Abi Talib. In Shi'i belief, Fatima is highly venerated. She is the preserver of the seed and regal glory (*khvarnahfarr*) of the Hidden Imam, a role Anahita performed for the Saoshyants in Mazdean teaching. The Shi'a refer to her as 'The Great Mary', and, according to M. Ayoub, the Isma'ilis³ give her the exalted titles of 'Creator' (*fatir*), 'Manifest Soul' (*nafs*) and 'Threshold' (*bab*).⁴ In the folklore of the Shamarq area the 'vein' refers to a seam of deep red stone in the cliff face. The second rider (Fig. 9), seated behind the horse to the left, has been carved in this red rock. Traces of red painted plaster around the figure may have been, in the past, also mistaken for veins or even blood. This figure is interpreted by villagers as Bibi Fatima herself, probably because of the wide necklace, and the fact that the muscular torso of the figure could be mistaken for breasts. This would suggest that in local tradition the central rider was thought to be 'Ali b. 'Abi Talib. Local women used to hold a gathering (*mela*) at the site every Wednesday. Within the last few decades, however, local mullahs outlawed the practice. According to local informants, the women sat on a dry stone platform, located directly in front of the carving. Whilst the platform is no longer visible on the surface, some traces of this structure seem to be visible when viewed from below the overhang.

The carving is barely visible to the naked eye from the Shamarq road, which runs through the valley under the cliff face. Even with binoculars, it is difficult to locate the carving from the present main road which runs on the east side of the valley. Traces of

³ Pul-i Khumri is one of the most important Isma'ili centres in Afghanistan.

⁴ Ayoub 1978, 35, 48–52, 70–2; see also Corbin 1990, 33, 51–72; Lee 1996, see ch. 6 in particular.

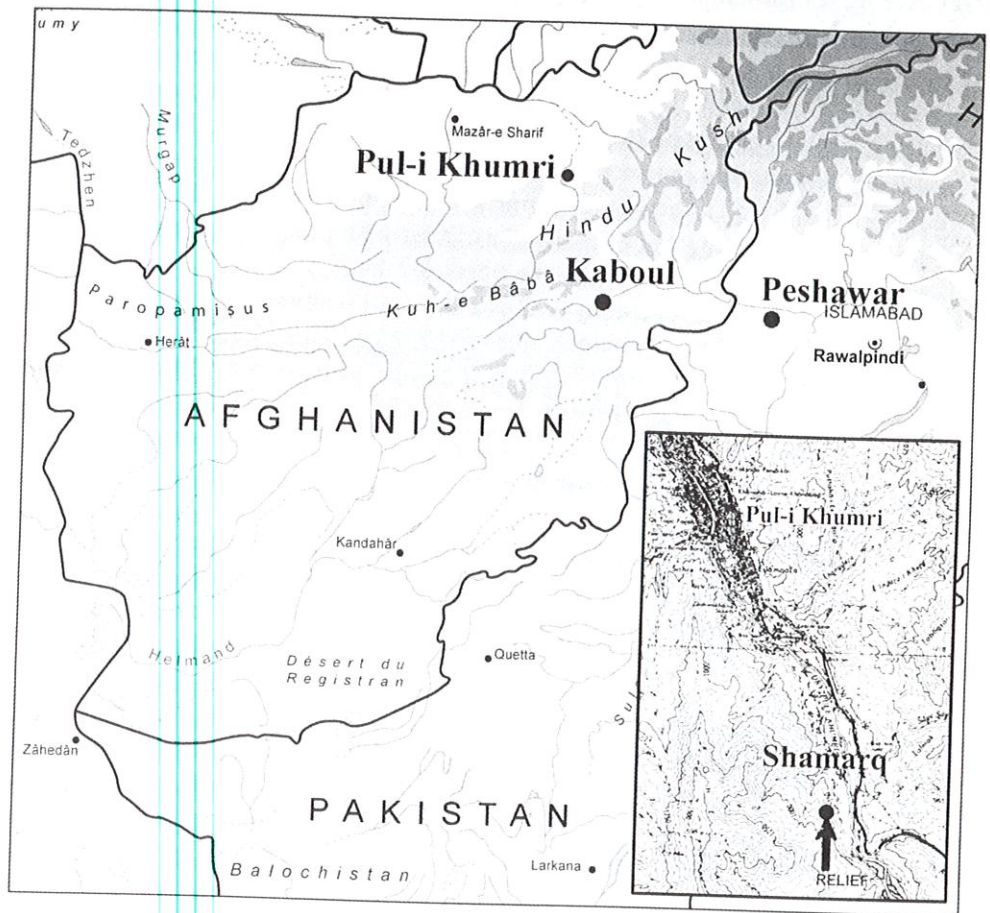


Figure 1. Map showing location of relief.

white and red plaster and paint on the rock carving (see Ory below) suggest that originally the sculpture was painted and probably stood out more prominently when newly completed. Even so, it is very unlikely that the carving was located where it is in order to be viewed by the general public. Indeed, why the carving was sited here remains a mystery. The left bank direct road, which runs underneath the carving, could have replaced an ancient trackway. However, in 1925 the road from Pul-i Khumri to Doshi was already located on the right bank of the river and was considered to be difficult to travel on (Foucher 1942–7, I, 22). Though we know little of trade routes at the end of the third century AD, early and mediaeval Muslim itineraries as well as eighteenth and nineteenth century European explorers, all indicate that the two major caravan routes

went either east or west of the present Pul-i Khumri to Doshi road. The present road was built to provide access to the Salang Tunnel and was constructed in the middle of the last century. The main ancient route from Khulm to Bamiyan passed west of Pul-i Khumri, through Aibak (present day Samangan), Khurram and the Dandan Shikan pass, whilst to the east the ancient route to Kabul was via Baghlan, Nahrin, up the Andarab valley to the Panjshir, and then down into Charikar and the Koh Daman (Le Strange 1905, 427; Ferrier 1857).

The discovery of a Sasanid rock carving in Afghanistan raises again the issue of J. P. Ferrier's claim that he discovered a Sasanian rock carving depicting 'a king on his throne administering justice before his assembled court' (Ferrier 1857, 229) somewhere in the Tir Band-i Turkistan mountain range. Ferrier's notice has been controversial, and a number of expeditions have been mounted without success.⁵ Both Grenet and I have contributed to the search and debate over the past two decades (Grenet *et al.* 1980; Lee 1982; Grenet & Lee 1998). The discovery at Rag-i Bibi rehabilitates Ferrier's report. However, Rag-i Bibi cannot be the Ferrier rock relief. Firstly, Ferrier's relief is further west, somewhere in the mountains between Sar-i Pul and Daulatyar. Secondly, the subject at Rag-i Bibi, a hunting scene, is very different to Ferrier's description of a king administering justice before his court. Even assuming Ferrier confused the locations (his original journal was lost when he was imprisoned in Girishk and he had to rewrite it from memory), Ferrier could not have visited Rag-i Bibi since he did not travel through Pul-i Khumri. Instead he travelled the caravan route to Bamiyan, via Aibak, Khurram and Dandan Shikan. Anyway, at this point in his travels, Ferrier did much of his travelling at night due to the war between the Wali of Khulm and Dost Muhammad Khan. Even so, in the light of the Rag-i Bibi discovery, there is now strong justification to mount a further expedition to try and locate Ferrier's relief.

II. Description and technical observations

François Ory

The Rag-i Bibi relief measures 4.90 m in height with a maximum width of 6.50 m (Pl. 6). The first impression is one of the exceptional depth of relief of the standing figure in front of the king, which reaches 2.50 m in the axis of the composition (Fig. 6). While the hind legs of the king's horse are in rather shallow relief, its torso is fully in the round. Even the front left phalera (Fig. 7), visible only from close up, was roughly worked, while its inside surface was left unworked.

This depth of relief and the many cracks in the local sandstone obliged the sculptors to add at least twelve 'prostheses': two for the king (face and crown), three for the

⁵ Of particular note was the expedition, in the 1960s, by Professor Bivar, see Bivar 1966, 58ff.

dying rhinoceros (horn and ears), four for the running rhinoceros (top of the back, head and breast), two for the standing character in front of the king's horse (head and right arm) and one for the head of the horse of the last rider following the king. These parts were carved from additional stone blocks attached with mortar, supplemented in most cases by tenons and mortises (the latter are still visible). These parts are all now missing, presumably having fallen off a long time ago. A row of holes at the top of the composition, above the carved balustrade, was probably used for a protecting roof (Fig. 4). Other holes, preserved along the right edge, were left from the scaffolding used to execute the relief. According to visible traces the chiselling tools were a five-toothed chisel (well documented on Sasanian reliefs from Iran—Herrmann 1981a) and a 1 cm wide gouge. No traces of fine pick or polishing could be observed. Traces of white coating and reddish painting, best preserved at the level of the top balustrade which is protected by the overhang, were also found. Remains of plaster were also noticed at Bishapur on Reliefs II and VI (Herrmann 1981b, 21; 1983, 12).

The figures are about 20% over life-size, while we estimate the height of the king to be 2.40 m if he had been standing. His horse is galloping, with its left front hoof resting on the dead animal and its right on the pile of rocks before him (this leg is missing between knee and hoof). The king is bending a bow, while in front of him is a running animal, whose head (now missing) was probably turned to the right. The animal can be identified as an Indian rhinoceros (Fig. 2). The skin resembles that of a rhinoceros: the scales on the rump are well delineated and the rough skin on the middle part of the body is rendered by long strokes of the gouge. The short, thick tail and the very bent forelegs and slightly bent back legs correspond to a rhinoceros. The same animal, dying, is shown lying down, partly overrun by the king (Fig. 3). Here the identification as a rhinoceros is even clearer: the square mortises (still containing plaster) correspond to the ears, the drill and imprint at the base of the missing horn. The few small teeth of the rhinoceros are exaggerated (they are indicated only on the most visible side!) to make the beast look more ferocious, but otherwise the image is realistic.

We know, thanks to Babur, that the rhinoceros could be hunted with a bow (Babur, transl. Beveridge 1922, 490). On a Moghul miniature illustrating Babur's description of a rhinoceros hunt (Pl. 5) one can see the running rhinoceros and the dead one behind a conventional pile of rocks and also the presence of a tree, exactly as at Rag-i Bibi where a mango tree stands between the king and the running rhinoceros (Fig. 5).

A figure in characteristic Kushan clothes stands in front of the king and behind the head of the king's horse (Fig. 6). His head and arms are missing. This figure can be compared to the well-known statue of the emperor Kanishka at Surkh Kotal, as well as to a painting from the Fayaz Tepe monastery at Termez. These both show the parted legs, the trousers with deep folds, the heavy boots and the kaftan with a lapel on only one side.

There are two horsemen behind the king (Fig. 9), the first wears the Sasanian tunic and the characteristic hat, the *kolah*, the rounded outline of which is recognizable in

traces left over the missing head, while the second is dressed in Kushan style. Faint traces above his missing head could belong either to a *kolah* or to a pointed Kushan tiara. His raised right arm seems to come out of the composition. The hilt of a sword is visible on his left, while he carries a double quiver on his right (the same object, though mutilated, is depicted behind the king's right leg; the hilt of the sword and the top of the bowcase are visible on the other side).

This type of double quiver, with the front box closed and the back one open with the protruding feathers of the arrows, was typical military equipment of Central Asian warriors in the first centuries AD. This has been demonstrated recently by a series of finds belonging to various nomadic ethnic groups: the Orlat bone plates found near Samarkand (Fig. 10), dating probably from the first or second century AD and showing Sarmato-Alan ('Kangju') cataphracts; the Takht-i Sangin bone plates showing Yuezhi archers; an engraved horn from Kalaly-gyr 2 in Khorezm; finally, a real specimen of uncertain date found at Niya in Chinese Turkestan (from a Saka burial?).⁶ Although not documented in Kushan art, where precise images of armed horsemen are scarce, it was probably borrowed by the Kushans and then by the Sasanians who took it when they campaigned in Bactria. The borrowing was not complete, however, because in all other known examples the bowcase is combined with the double quiver while at Rag-i Bibi it is carried on the other side. Another detail on the Orlat and Takht-i Sangin plates is the the cover tail of the king's horse (Fig. 10). Contrary to the double quiver this detail ~~only~~ occurred once in Sasanian art from Iran, on Ardashir's investiture relief at Naqsh-i Rostam.⁷ Thigh clamps are visible in front of the king and the last rider.

A balustrade is represented at the top right (Fig. 4); similar structures are found on Gandharan sculptures. On the left side, the pleated triple end may have belonged to a ribbon carried by a putto (ribbons hanging from a banner, the only other alternative, does not seem probable since no staff is visible in front of the balustrade).

Finally, one can note the precision of some details, such as the veins on the front legs of the king's horse, the buckle of the king's belt (see Grenet, below), the sword hilts wrapped in rope, the fruits and leaves on the mango tree. The pronounced naturalistic character of the sculpture is accentuated by the deep relief and the dynamism. These features give the Rag-i Bibi relief a strength, vigour and movement not encountered on western Sasanian reliefs and might well indicate a contribution by Bactrian or Gandharan sculptors.

⁶ All these examples are reproduced and discussed in Ilyasov 2003, 292–300, pls VI–VII and X.3–4, except for the engraving from Kalaly-gyr 2 which was subsequently published (Vainberg 2004, 184–7, fig. 5/24 and back cover; the proposed date, second century BC, seems far too early).

⁷ See Ilyasov 2003 for a complete study of the origins and developments of the tail cover. Herrmann 1969, 1981a, interpreted the detail on Ardashir's relief at Naqsh-i Rostam (pl. IV, fig. 4) as a tied ribbon; in his article Ilyasov (p. 269) takes this as the most likely possibility, but Herrmann's photograph leaves no doubt that it is a leather or metallic cover with a stepped edge at the bottom.

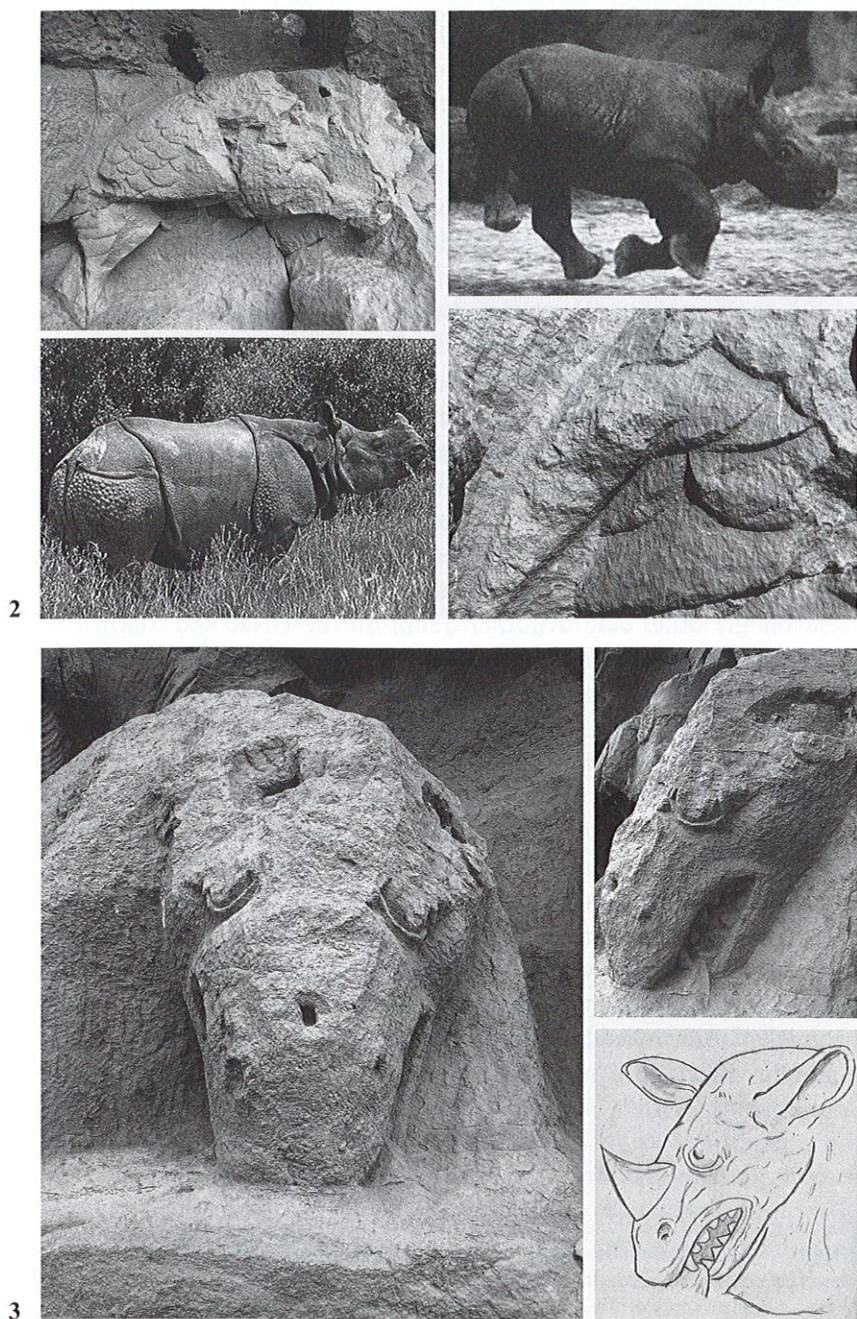


Figure 2. Above left: running rhinoceros on the relief. Below right: tail. Above right: Indian rhinoceros (*rhinoceros unicornis*) running. Below left: Indian rhinoceros standing.

Figure 3. Head of the dying rhinoceros. Below right: reconstruction with added parts completed (F. Ory).

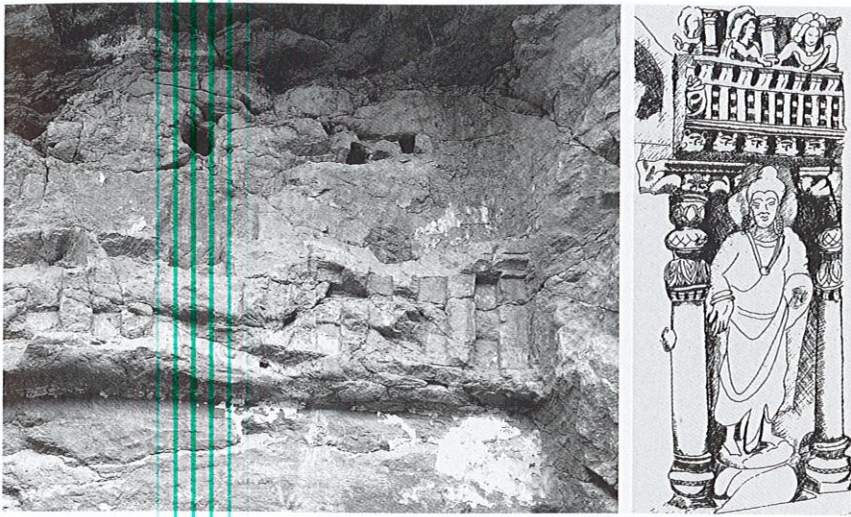


Figure 4. Left: balustrade, traces of painting, holes for wooden roof. Right: analogy on a relief from Sahri-bahlol (source: Tissot 1985, pl. XII:6).

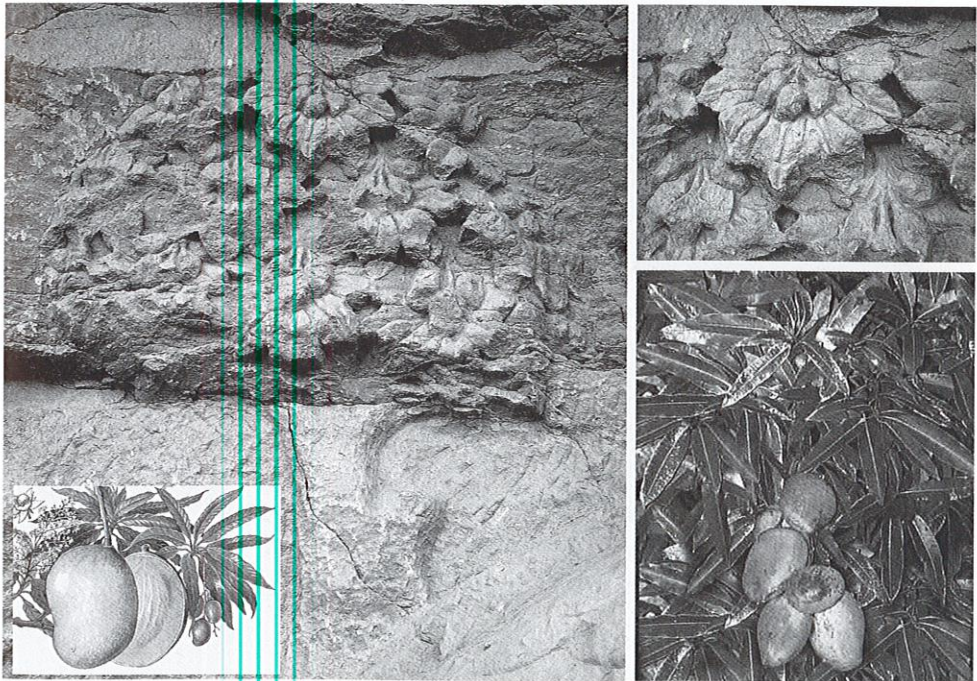


Figure 5. Mango tree (general and detail), compared with fruits and leaves of *mangifera indica*.

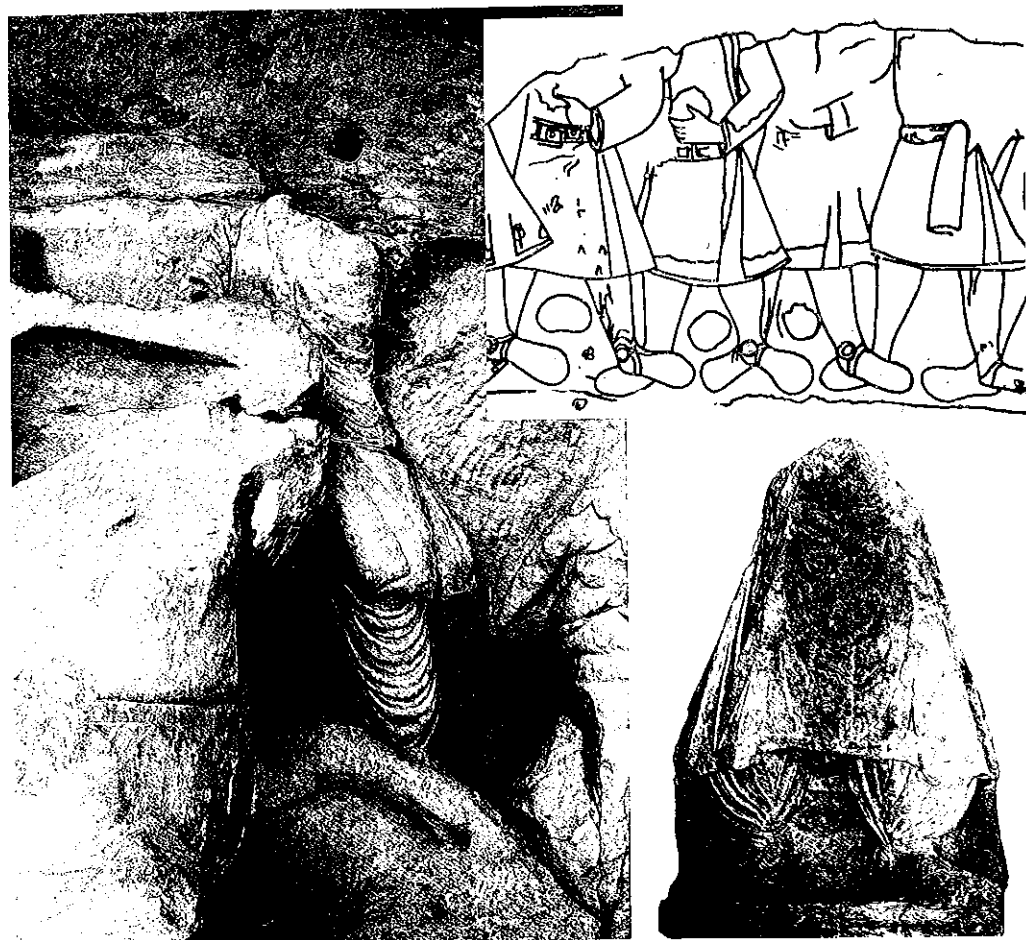


Figure 6. Left: Kushan standing behind head of king's horse (the hole of the mortise for the added head of the character is visible). Above right: Kushan princely donors, drawing of painting from Fayaz Tepe, second half of the second century AD (source: Al'baum 1990, fig. 3). Below right: statue of Kanishka I from Surkh Kotal (photo F. Ory).



Figure 7. Left: phalerae on king's horse (below left: rear phalera, below centre: front phalera). Right: phalerae on Shapur I's horse at Naqsh-e Rostam 6 (source: Herrmann 1989, pls 1 and 8).



Figure 8. Ornament on buckle of king's belt, compared with the Simorq flying towards Rustam on a Panjikent painting (document B. Marshak).

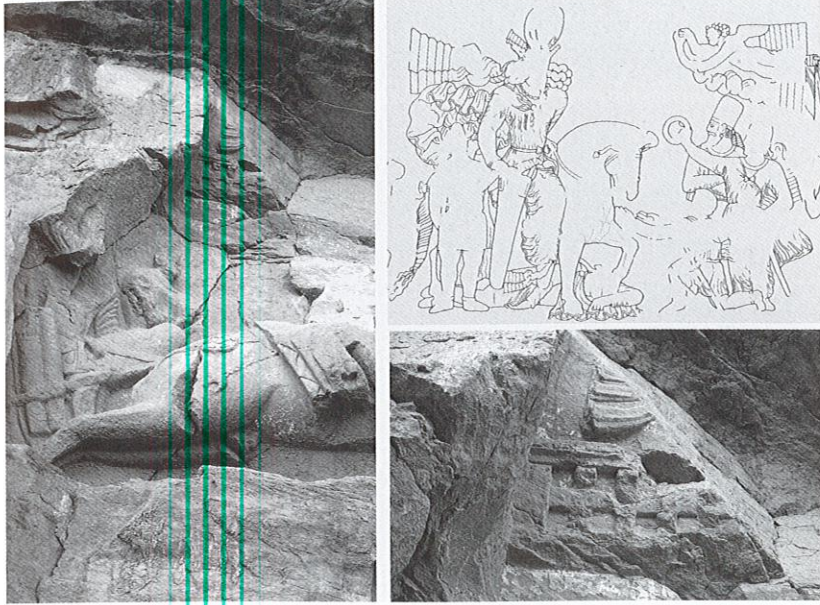


Figure 9. Left: followers on horseback, surmounted by ribbons hanging from a disappeared wreath. The first rider has been taken as 'Bibi Fatima', the second one has his right arm raised. Below right: ribbons over balustrade. Above right: compositional analogy at Bishapur III (source: Herrmann 1989, text fig. 5).

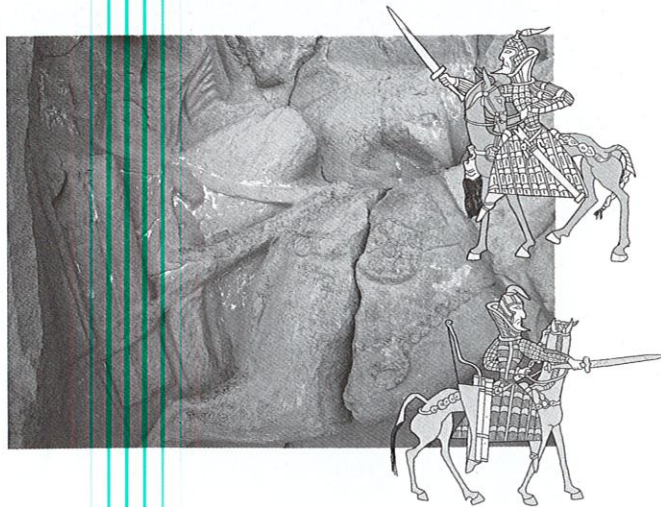


Figure 10. Left: back of king's horse with double quiver, tassel cap, pleated tail with cover; followers on horseback with double quiver. Right: analogies on bone plates from Orlat, first-second century AD (drawing F. Ory).

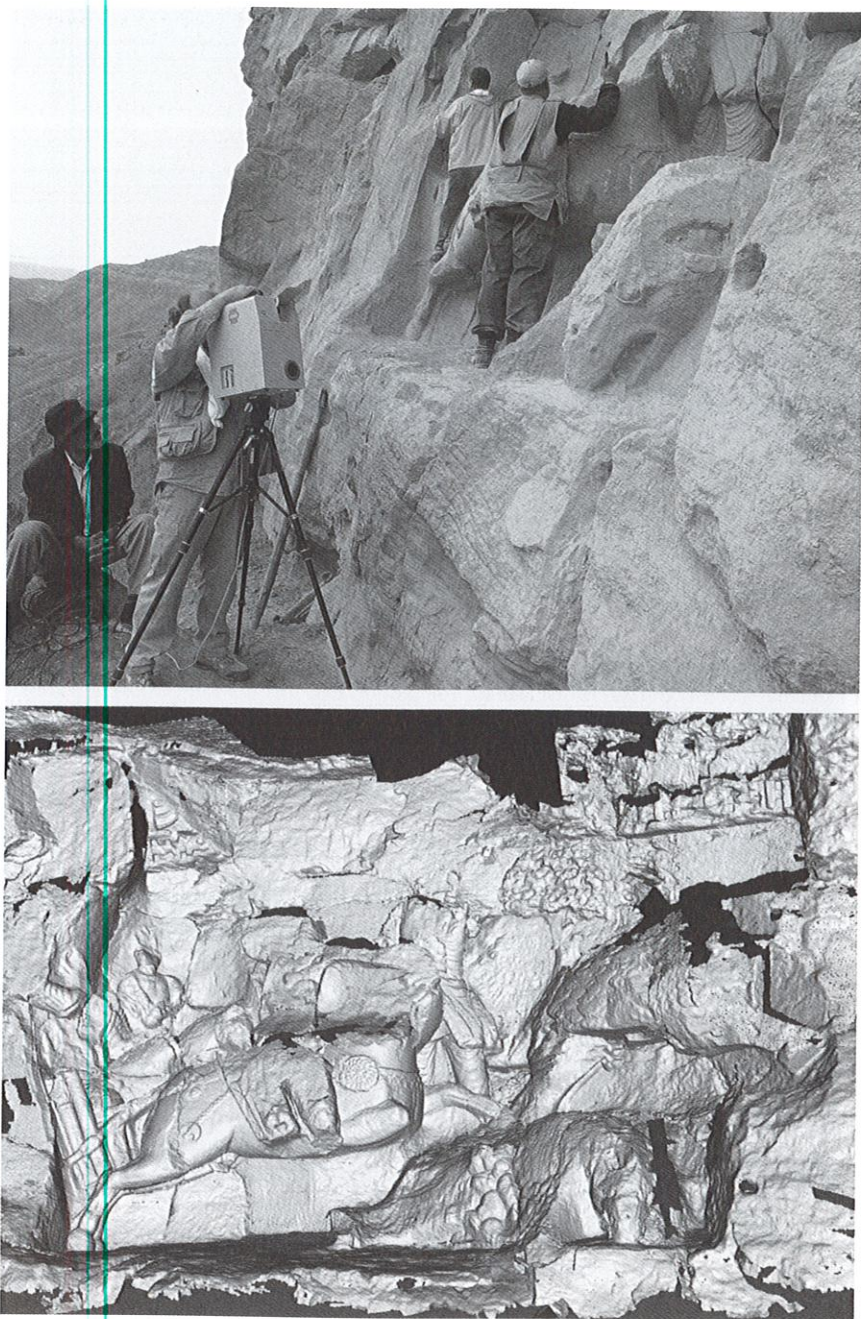
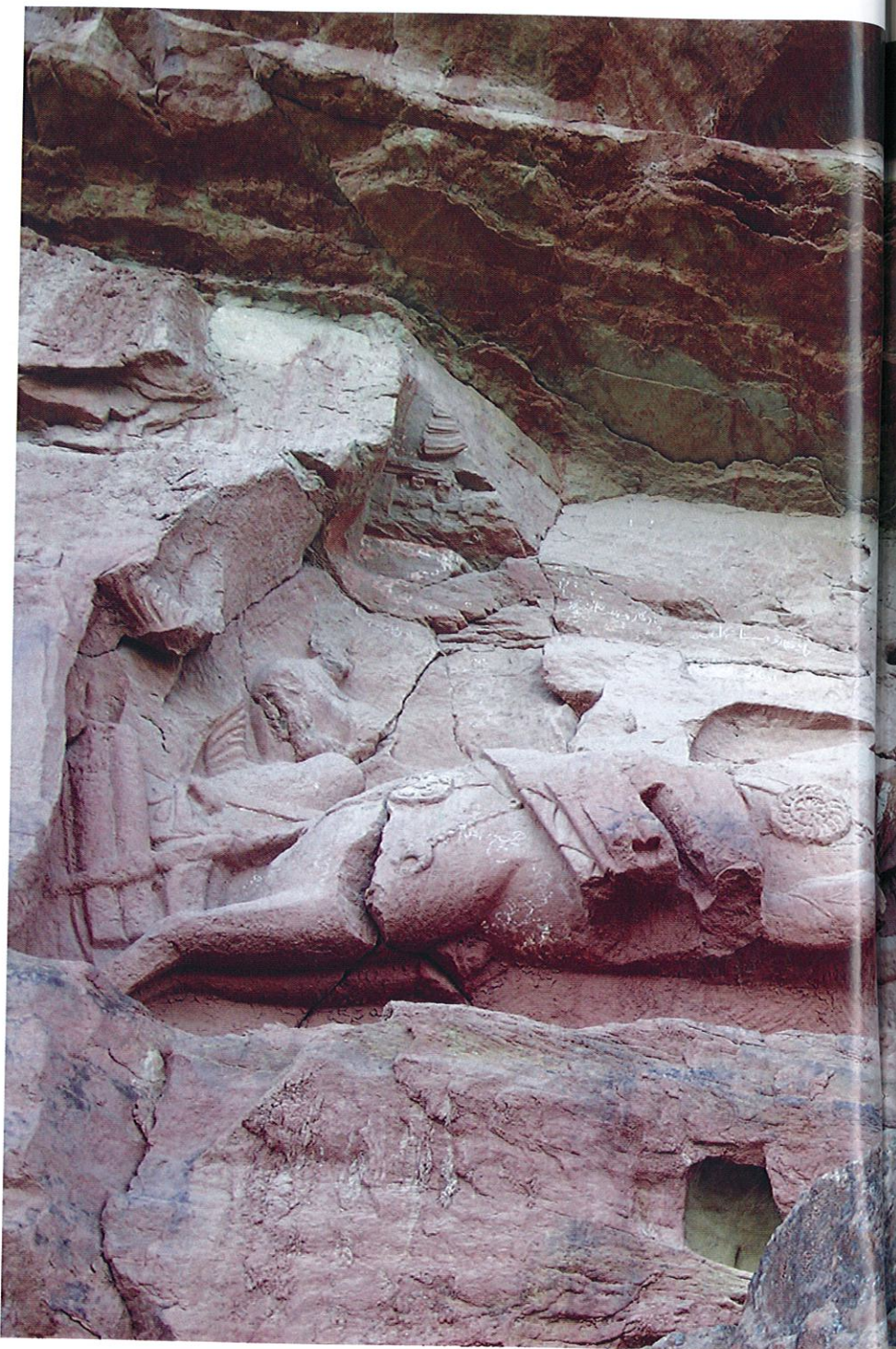


Figure 11. Top: Philippe Martinez doing the 3D recording. Below: the 3D model (in the course of processing).



Miniature from *Bābur nāma*, British Museum, Or. 3714, fol. 352 a: Babur hunting rhinoceros in Hashtnagar and Peshawar (photo courtesy British Library).

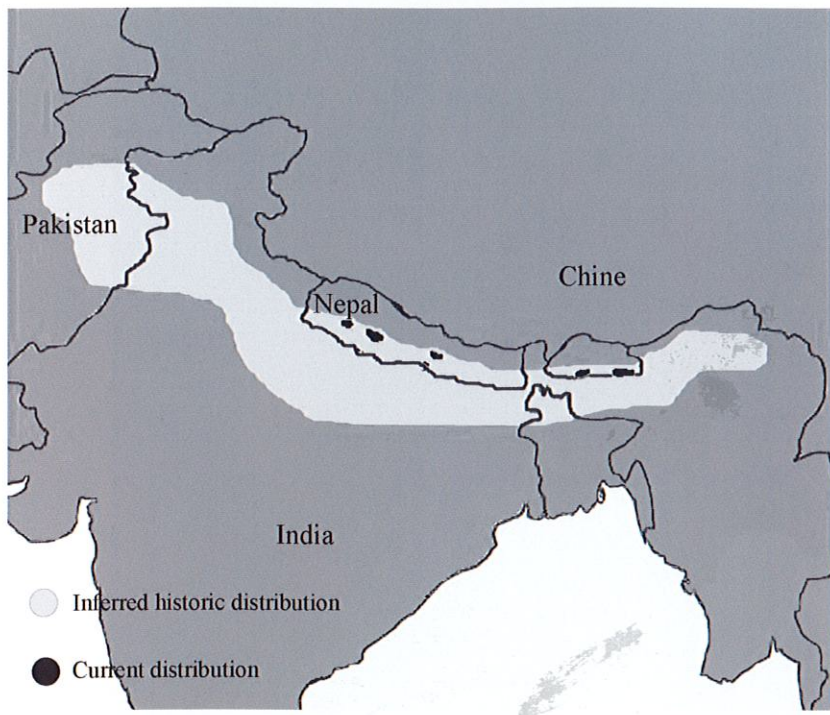


Rag-i Bibi relief (photo F. Ory).





a.



b.

a. Gold Coin of Kumaragupta I (British Museum). b. Distribution of the Indian rhinoceros (F. Ory).

III. Iconographic and historical comments

Frantz Grenet

The Rag-i Bibi relief (Pl. 6) raises many problems. At this preliminary stage of research two main questions must be addressed: who commissioned the relief? What message was it supposed to convey in that particular place?

The early Sasanian character is clear. The only feature which really betrays the influence of local Buddhist art is the balustrade on the upper edge (Fig. 4). In addition, one and probably two characters wear Kushan dress (Fig. 6), but the main figure and the first rider behind him (Fig. 9) exhibit the more tightly fitting folds typical of Sasanian costume. Despite abrasions it is still possible to recognize the specific rendering of rounded floating folds at the back of the trousers of the main figure. Unfortunately this figure has lost such potentially characteristic features as its crown and beard, but the general shape of the Sasanian bunch of hair behind the neck is preserved. The tassel attached to an indented cap suspended by a chain on the rump of the horse (Fig. 10) is also a Sasanian feature (the wavy hairs of the tassel, not carved in the stone, were probably added in painted plaster, like some other minor details of which the presence can be presumed on the main figure: ribbons, fluttering cloak, and so on).

The general compositional scheme conforms to a Sasanian hunt, with the same animal represented twice, once alive and then dead or dying. This scheme, already documented on a pre-Sasanian wall painting from Hatra (Venco Ricciardi 1996, 159–61, fig. 7), makes its appearance in Sasanian art with the Krasnaia Poliana and Shemakha plates, which were probably executed towards the end of Shapur's I reign (240–272) or shortly afterwards (Harper 1981, pls 8–9, text *passim*). In rock reliefs it is attested only once, at Sar Mashad with the relief showing Bahram II (276–293) killing a lion (Trumpelmann 1975a; Vanden Berghe 1984, 138, pl. 29). On the Rag-i Bibi relief the apparently submissive Kushan character standing behind the head of the king's horse (Fig. 6) introduces another compositional element reminiscent of Shapur's victory reliefs at Darabgird and Naqsh-i Rostam with the captured Roman emperor standing in the same position. There are other close analogies with several of Shapur's reliefs. Although Rag-i Bibi is unique by its depth and perspective, it shares its general concave shape with Bishapur III (Herrmann 1980; Vanden Berghe 1984, 131–3, pl. 24). The flying figure carrying a ribbon which can be restored behind the king's head exists only at Bishapur II and Bishapur III (Fig. 9).⁸ At Bishapur III, this figure is set over a standing attendant handing a wreath to the king; the same combination probably existed at

⁸ Herrmann 1980 and 1983; Vanden Berghe 1984, pls 23–4. In both cases the flying figure faces the king, while at Rag-i Bibi it could only fly behind him. The chronological relevance of the flying putto is stressed by Herrmann 1989, 23 and figs 5–6. The lengthwise pleating of the ribbons at Rag-i Bibi, different from the more widespread transversal one, finds parallels on some coin issues of Shapur I (Alram & Gyselen 2003, 230 and pls 30–3, see especially coins 144, 147, A 45, 159).

Rag-i Bibi, as this is the only explanation of the raised right arm of the second rider (the one in Kushan dress) behind the king.

The horse trapping is more difficult to use for diagnostic details because local fashion might have exerted its influence, as was certainly the case with the double quiver and, ultimately, with the tail cover. Some significant observations can be made, nevertheless. The long pleated tail, traditional in Central Asia (Fig. 10), appears on Sasanian reliefs only between *c.* 260 (Shapur at Naqsh-i Rostam 6) and *c.* 280 (Bahram II at Bishapur IV);⁹ on the contrary, later Sasanian images almost always show tied tails. On reliefs the only Sasanian ruler who rides a horse wearing as few as four non-suspended phalerae is Shapur I at Naqsh-i Rostam I¹⁰ and Naqsh-i Rostam (Fig. 7); in the latter case at least, the phalerae are decorated with heart-shaped petals, like the rear ones at Rag-i Bibi.¹¹ Again, the method of fastening the belt with two large buckles with no bow and ties appears only with Shapur at Naqsh-i Rostam (Herrmann 1989, 23, pl. 12). Taken together, these analogies converge in the final period of this king, and the impression is confirmed by the very naturalistic style of the relief: compare, for example, the rendering of the veins of the horse's legs at Rag-i Bibi and on Shapur's relief at Naqsh-i Rostam. Consequently, I would propose Shapur as the most likely candidate for the hunting king, the most probable date being in the 260s. His eldest sons and short-reigned successors, Hormizd I (272–273) and Bahram I (273–276), cannot be excluded in theory (thanks to coins issued in Balkh we now know that Bahram still held direct control there),¹² but Shapur seems to be the best option. Peroz I and Hormizd I, the two most powerful Kushano-Sasanian kings who in theory could be candidates, did not reign before the 280s (see note 16); this seems to be too late for our relief, if one assumes that sculptors at Rag-i Bibi closely followed the rules of composition, style and realia used in contemporary imperial works in Iran.

The second question which arises is the significance of the Rag-i Bibi relief. Why employ expensive labour and first class sculptors just in order to depict the king hunt-

⁹ See, respectively, Herrmann 1989 and Vanden Berghe 1984, pl. 28. At Naqsh-i Rostam 7 (Vanden Berghe 1984, pl. 30), apparently a later relief of Bahram II, the horses have knotted tails, which suggests that this fashion became generalized during this king's reign.

¹⁰ Vanden Berghe 1984, pl. 20 (the decoration of the phalerae is not visible, nor on any other published photograph of this relief).

¹¹ At Naqsh-i Rostam there are seven heart-shaped petals adjoining each other, at Rag-i Bibi only five with gaps between them, but the match is unique in the whole corpus of Sasanian royal images. Only two Sasanian plates show a king riding a horse with four phalerae, in both cases suspended: the one from Pereshchepino, usually attributed to Shapur II (Harper 1981, 81–2, pl. 28), who might well have copied this fashion from his eponymous great-grandfather Shapur I (whose crown he also copied); and the unfinished plate from Nizhe Shakharovka (Harper 1981, 86, pl. 32), possibly depicting Shapur III, another namesake. The front phalerae at Rag-i Bibi have a whirling motif which, in a simpler form, is widespread on phalerae in Gandharan sculpture but is also met with in Sasanian art (e.g. the Turusheva plate, attributed to Shapur II and probably manufactured in the East: Harper 1981, 197, pl. 37).

¹² Nikitin 1999 (the king is correctly identified but the dates given are those of Bahram II). Another coin from the same king also inscribed with the Balkh mint was reported during the conference.

ing rhinoceros under mango trees, high above a valley where rhinoceros never dwelt and mango trees never grew? According to Babur, who is our most precise source of information on this point, in the sixteenth century the rhinoceros was first encountered in the Peshawar plain and in Hashtnagar, the hill country of the Afridis around the Khyber pass (Pl. 5—Babur, translated Beveridge 1922, 489–90). This is exactly the eastern limit of Shapur's empire according to his great inscription at Nasqh-i Rustam: *Kušanšahr tā frāz ō Pāskabūr*, 'Kushanshahr as far as Peshawar' or perhaps more precisely 'as far as the gateway to Peshawar' (Huysse 1999, 1:24, text and translation; 2:36, commentary). This situation was created when Shapur, who had inherited the conquest of Bactria from his father Ardashir (224–240),¹³ seized the upper Kabul valley from a late Kushan king, either Kanishka II or Vasishka.¹⁴ This frontier lasted throughout the reign of Bahram II (276–293), as is shown by the repetition of the same formula in the description of the empire by Kartir (MacKenzie in Herrmann 1989, 55, text; 58, translation; 64–5, commentary). A second phase of expansion occurred under Peroz I, second or third ruler of the client dynasty of the Kushano-Sasanians to whom the Sasanians entrusted the eastern territories when they gave up direct rule: in Gandhara, Peroz issued gold coins showing on the reverse side the goddess Ardochsho, protectress of the later Kushans, presenting him with the Kushan tiara,¹⁵ and he initiated there the Kushano-Sasanian gold and bronze series. For various reasons I incline to place his conquest in the 280s or 290s.¹⁶

¹³ According to Tabari (i. 819–20) Ardashir campaigned in Merv, Balkh and Khwarazm, then went back to Fars where he received envoys presenting the submission of the kings of 'Kushan, Turan and Makran'. Another source, the *Nihāyat al-Irab*, states that 'he dwelt in the city of Merv for one year, until all the kings of Khurasan had brought him their submission'. This does not seem to imply direct rule at this stage, which according to the sequence of events in Arabo-Persian sources should be put early in his reign (see Widengren 1971 for a full discussion of these sources, and Alram & Gyselen 2003, 29, for the numismatic evidence from Merv). The last Kushan ruler whose coins, not imitations, were issued in Bactria was Kanishka II, for a short while (Joe Cribb, personal communication). A date in 233 for the full conquest of Bactria is suggested by Roman records, according to which Ardashir's western armies were 'disbanded' during the winter of 232–233, to the great surprise of the Romans who were expecting an attack (Herodian VI.6.5–7.1). This date was formerly thought to mark the beginning of the era used in late Bactrian documents (Humbach 1971; Sims-Williams 1999), but it has since been proved that this era corresponds to Ardashir's accession to the Iranian throne in AD 223–224 (de Blois 2007).

¹⁴ According to a recent re-examination of the coins from the bazaar of Begram (Bopearachchi 2003). The presence of an elephant with tribute-bearers at Bishapur III suggests a fresh victory in India, see lastly Herrmann 1998.

¹⁵ Göbl 1984, coin 555, commentary, 81; Carter 1985, pl. 48 coin 23, commentary, 232–4, 272; Cribb 1991, pl. IV coin 30, commentary, 188.

¹⁶ A full re-examination of the vexed question of the chronology of Kushano-Sasanian kings would be beyond the scope of the present discussion. The two best argued reconstructions propose a global span of, respectively, c. 270–c. 350 (Carter 1985) and c. 245–c. 350 (Cribb 1991). These reconstructions should now be revised in the light of new facts: the beginning of the Kanishka era in 127 AD (Falk 2001), the existence of a coinage of Bahram I (273–276) at Balkh. The semi-independent dynasty of the Kushanshahs came into power after Bahram I, maybe shortly afterwards, maybe after the rebellion of the eastern provinces in the early 280s (thus Nikitin 1999). Peroz I Kushanshah's campaign in Gandhara took place in the early years of the 'little Kushan' Vasudeva II (whom Göbl, perhaps rightly, calls Vasudeva III), as the reverse of the victory coin is copied from the first issue of that

The earlier existence of the Peshawar frontier provides the best possible explanation for the apparently strange choice of motifs. In showing rhinoceroses and a mango tree, the Sasanian ruler, most probably Shapur, intended to show that his empire stretched as far as the country where the rhinoceros was hunted and the mango tree grew, namely as far as the Khyber pass. The fact that one hoof of the king's horse rests upon the dying rhinoceros and the other one upon the rock symbol speaks for itself. It is surely not by chance that the relief is located at a point before an ancient road heading south of Bactria splits into two branches, one going through Bamiyan and the other through Andarab and Panjshir, before eventually joining again in Kapisa. Admittedly the section along the river between Pul-i Khumri and Doshi was not used much for regular traffic (see Lee above), but its function as a strategic short cut is shown by an episode of the Arab conquest in 710.¹⁷ All Sasanian hunting scenes are also political proclamations, but with the Rag-i Bibi relief the message is more specific than in any other case. One should also keep in mind that in India the rhinoceros is royal game, like the lion. Some gold coins of the Gupta ruler Kumaragupta I (413–c. 450) show him killing a rhinoceros with a sword, with the legend *khaḍgatrātā* which means at the same time 'vanquisher of the rhinoceros' and 'vanquisher by the sword' (Pl. 5—Altekar 1957) (Pl. 7). By assuming this role the Sasanian king proclaims his capacity to rule India, and thirteen centuries later Babur did not fail to rediscover this symbolic message.

Many other details should be commented on. The throatlash of the king's horse carries a lion mask, badly preserved but recognizable. On the king's belt the ornament is preserved on one buckle only, but surely the other was symmetrical. It shows a winged lion with one paw raised and the body ending in a twisted fish-tail (Fig. 8). Typologically this ornament is related either to the Graeco-Roman hippocampus or to the Indian *makara*, but as far as I know a completely identical creature is attested only in a later Panjikent painting (executed c. 740), flying towards Rustam's head. In the *Shāh-nāma* Rustam's particular protector is the Simorq, in Pahlavi the *sēnmurw*. According to Boris Marshak the image the Sasanians called the *sēnmurw* was this

long-reigned adversary (compare Göbl 1984, coins 555 and 569–70). In addition there is an overstrike of Peroz over Kanishka III, Vasudeva's immediate predecessor, and an overstrike of Vasudeva over Peroz (Cribb 1991, 172). Thanks to the recently established date of the Kanishka I era we now have some absolute dates for the Indian inscriptions of the 'little Kushans': Kanishka II in 232 and 244, Vasishka in 249 and 257, Kanishka III in 268 (the Ara inscription). One can guess that Vasudeva II (III) reigned from the 280s till the beginning of the fourth century or maybe later. On the western side, Peroz's immediate successor Hormizd I Kushanshah temporarily seized Merv, and there are good arguments, both numismatic and historical, to date this encroachment from the time of the minority of Shapur II in the 310s–320s (Carter 1985, 273 with n. 168; Loginov & Nikitin 1993, 249–50). His own successor Hormizd II Kushanshah wears a type of dress which did not appear before the reign of Shapur II (Tanabe 1996, 500). Taken together, these new observations suggest that Cribb's chronology should be shifted forwards by 20–30 years, while Carter's is basically right (though vitiated in details by her taking into account Harmatta's readings of inscriptions at Surkh Kotal and Kara Tepe, now discarded by all epigraphists).

¹⁷ Qutayba's campaign against the Nezak Tarkhan (Tabari ii. 1219–20, on which see Maricq 1958, 430–1; Grenet in Lazard *et al.* 1984, 202; Grenet 2002, 216–17).

creature only, not the one with dog's head and a peacock's tail to which art historians usually apply that name.¹⁸ A figure carried on the front buckle of his belt surely had a special value for the king and possibly his intention was to emulate Rustam, also a killer of monsters and traditionally associated with countries south of the Hindu Kush.

The role played by the Kushan standing in front of the king (Fig. 6) is difficult to ascertain. As already mentioned, his place in the scene corresponds exactly to that of the submissive Roman emperor in Shapur's reliefs. Although both his forearms are missing, it is clear that the Kushan is neither taken prisoner by the hands (like Valerian at Naqsh-e Rostam) nor is making a supplication gesture to the king by putting his hand on his forehead (like the 'old Roman emperor' at Darabgird I).¹⁹ Judging from the remains of his left shoulder he raises this arm, the one which is turned towards the running rhinoceros. He carries no weapons, but as his head is at the same level as the king's he is hardly just a gamekeeper. We are tempted to interpret him as a Kushan noble or even a Kushan king whose submission is expressed by him helping in the hunt.²⁰ The second of the two riders behind the king also wears Kushan dress, and, as he has kept his weapons, he seems to enjoy a better position (Fig. 9). Taken together, the message addressed to the Kushans is one of reconciliation rather than of humiliation. For the Sasanians, Kushanshahr belonged to Iran while the Roman empire belonged to 'non-Iran', and we can see now that they were keen to mark the difference.

IV. Digitizing the Rag-i Bibi relief: a methodological exercise in 3D laser scanning application

Philippe Martinez

The importance of this relief was recognized as soon as the first images were received at our laboratory. Not only was the rock relief unknown, but it was also apparently difficult to reach and an obvious target for the antiquities traffickers. Exceptional measures were therefore required to enable us to preserve the most complete record of the

¹⁸ Marshak 2002, 37 (where it is argued that the Panjikent image derives from earlier Hephthalite models). In Grenet 2002, 219–20 I propose to attribute the same significance to an analogous creature shown on coins of a Turkish ruler in Arachosia. On a fragmentary Kushan royal statue from Mathura an ornament of uncertain function shows a pair of winged lions, but in this case there are no tails (Rosenfield 1967, figs 6–7). From Mathura also comes a Kushan capital shaped like a winged lion with a pointed reptilian tail, different from the coiled fish tail with fluke depicted at Rag-i Bibi as well as at Panjikent (Czuma 1985, no. 9).

¹⁹ Though there seems to be no alternative to the identification of the three Romans as Gordian, Philippus and Valerian, the Iranian king's crown and the style of the relief pose a problem. For various hypotheses, see Herrmann 1969; 1989, 18–28; Trümpelmann 1975b; Meyer 1990.

²⁰ An anachronical but, to my mind, not completely irrelevant parallel exists in the medieval history of Transoxiana: in 1264 the deposed Chagataid khan Mubarak-shah (or his son, according to one source) was made a chief *barschi* (hunter with cheetahs or panthers) by his relative, the new khan (Barthold 1977, 491 with fn. 243).

sculpture and its surroundings. Because the relief was so high on the mountain, it was not possible to be on the same level and to take photographs without distortion: this made it impossible to choose either photogrammetry or to draw from photographs. However, our laboratory had been experimenting with optical triangulation 3D digitizing. This seemed an excellent opportunity to test its relevance in a difficult context where no other means seemed to be appropriate.

However, this approach had technical limits, as the 3D scanners available on the market are not universal tools. They can be divided into groups according to the technology on which they are based. These groups differ in terms of range and resolution. In the case of the Rag-i Bibi relief, we had to consider the cliff on which the relief was carved. Such a site would in itself require long range scanning, but we were also looking at an intricate sculpture with high relief and precise details, calling for short range scanning. Because Frantz Grenet considered that the mission was urgent and that only a limited task force could be employed, we opted for a Minolta Vivid 700 short range scanner, graciously lent to us by Minolta America, thanks to our active collaboration with the San Francisco based Insight group, or Institute for the Implementation of Digital Techniques. Although already slightly outdated, the Minolta Vivid camera would deliver crisp and detailed scans that should make possible an exact digital copy of the sculpture.

However, this choice necessarily caused problems. The Minolta camera is a short range scanner—and that really means short. The best measures are taken at around 0.8–1.2 m: the actual measure can reach an object at around 3.0 m, but the measurements at that range are of a lesser quality and lower density. That meant that the further from the object the camera was sited, the lesser the density, a serious problem in areas with much sculpted detail, which might be difficult to reach. Another problem was that, since it is based on a red laser, the scanner cannot be used in bright daylight, as the sensor is blinded by the wavelengths of solar light. Work could only, therefore, be undertaken when the cliff was in shadow.

Three-dimensional scanning by optical triangulation is based on a straightforward technological approach already known in Total Stations. A laser beam or ray emitted by the sensor hits the object which reflects it. This image, returned to the camera, is seen and captured by a CCD device. The distance between the laser and the CCD being fixed and known, the distance to the object is automatically deduced and turned into an actual physical x, y, z spatial measurement corresponding to every pixel of the capturing CCD camera. The camera is also used for capturing images: the colour of the zone being scanned is registered to the measured 3D points, each receiving a specific colour close to the actual colour of the surveyed area under a specific light. Because of the size of the CCD, the images are not of a high precision and quality. However, with a relief that did not preserve much of its original polychromy, this seemed to be of secondary importance.

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Advantages of the chosen camera included its compact size, user-friendly operation and its robustness, all of which were central to the success of the mission. It could be carried on board different aircraft, and its robustness was essential when being driven on Afghan roads or carried up cliff paths.

The camera, set on a regular video tripod, chosen for its stability, is manageable by a single operator (Fig. 11, top). It is powered by straight AC/DC electric power or can be operated from a car battery or using a generator. The operator directs the lens towards the surface to be scanned, helped by a small colour monitor set in the back of the camera. He chooses an acceptable level of zoom, considering the distance, before pushing a button to launch a pre-scan to provide an idea of the quality of the measurement thus acquired. The sensor has a limited depth of field of 200 mm, and the user has to define the exact distance at which this depth of field has to be situated from the camera, helped by an autofocus function. If the surface is complex, with different levels and depths, it might be necessary to do many shots of the same area, with different settings. The data were stored directly on a 512 Mb Compact Flash card, which enabled us to come on site without a control computer, the data set being saved on a self-powered, portable hard drive.

However, the practical limitations of access to the sculpture almost jeopardized the whole operation. The relief is accessible only via a narrow path, traced by local goatherds and villagers. Workmen carried the gear to the working site, its compactness being welcome. A petrol powered generator was rented and left on site under guard. Though noisy and at times slightly capricious, it enabled us to get the necessary power. The camera was protected through the use of a power regulator. Even with the equipment on site, the topographical limitations initially appeared to be impossible to overcome. The rocky ledge in front of the relief was uneven and only part of the relief was accessible to scanning, when the tripod was almost fully extended, leaving most of the upper parts out of reach to the laser. Furthermore, the cliff was only in shadow during the afternoon, when the remaining glare was still disturbing for the sensor.

It was therefore decided to build a platform in front of the sculpture and to scan at the end of the afternoons, in semi-dusk: we also had to respect the curfew observed by foreign missions. Unfortunately, it was not possible to build a wooden scaffold because of the poor quality of the locally-available wood and the slope of the rock under the relief. A search for metal scaffolding was finally successful when we were directed to an abandoned cement plant built by a Czech consortium. Our Afghan carpenters amazed us with their erection of a sturdy platform directly on the native rock that was stable enough to welcome the visit of the provincial governor. This impressive device enabled us to be level with the rock cut platform and established a base for the whole niche and for the necessary distance to scan most of the reachable surfaces.

The platform was also useful for the more classical inspection of the sculpture and for its photographic survey. Considering the ambient light, it was only possible to scan for about two hours each day before returning to Pul-i Khumri. On the other hand, the

time thus freed was used every morning to check the data gathered the previous day, thus validating on a daily basis. During the six remaining days, it was possible to gather more than 1000 scans in around 15 hours. Conditions were also problematic for the quality of the colour images embedded in the scan files. There was no way to calibrate or control the lighting of the rock face, which changed during each scanning session, from yellowish to dark and blueish. These images were later corrected and homogenized, but it is clear that our final viewing of the model with colours is not faithful enough, although it remains informative.

Our scanning operation resulted in an important archive of more than 1000 scans, although each covered only a limited surface of the monument. The scans had to be reassembled to form a thorough 3D model of the monument. This was done through the use of the *GSI Studio* software, which we were able to use thanks to our relationship with Insight. The files from the camera are text files containing the information for the three x,y,z measurements of the points and other values such as the reflection of laser beam on this point and the digital colour image linked to the 3D point cloud. When imported in GSI, these data sets are turned into 3D meshes linked to a colour information for each of its vertices. The actual registering of the different scans is a complex operation. It could have been helped by the positioning in the scenes of specific targets, but due to our limited access to the relief we had to choose a more straightforward approach that only considered a limited amount of shared surfaces between each scan. As we could not use targets to help registration, we used the tools offered by *GSI Studio*, i.e. algorithms based on an approach called ICP (Iterative Closest Point), which considers the topology of each of the surfaces (or point clouds) and by considering each point and its closest neighbours manages to match the corresponding topologies and mix the scans according to these matches.

In reality, the process is straightforward. The user loads two scans. On each of them, points that should be the same are pointed and coupled, three pairs being the least required to help the software decide the corresponding orientation of the scans (as the position of the scanner has changed between each scan, and thus the orientation of the scan itself). Once this preliminary set has been made, the software launches its topological correlation and iterates the process until it reaches a level of error that seems acceptable. Each scan remains independent until the user is happy with the matching offered by the software. Every time one match is finished, it is possible to load a new scan and to push the process forward. Once the process is finished for a specific surface, it is possible to launch another matching process that is known as global. This checks on the optimization of the topological matching when all the scans present in this 3D surface are considered, instead of the single pairs considered in the ongoing process. Needless to say, this final global approach is complex and greedy in terms of processing power.

Following this approach, each scanning session considered a limited area of the sculpture to keep the topological relationships as close as possible. We ended with six

different scan groups sharing part of their topology on certain edges. At this stage, every one of these registered groups was already heavy in terms of RAM access. To move to the final fitting we had to simplify these groups of scans, considering mainly the repeated information in the overlapping areas, and turning these complex clusters into single surfaces that could be joined through a renewed registering process.

Since our portable computer was powerful enough to handle these tasks, it was possible to make a preliminary registration of these groups of scans on a daily basis, thus knowing which areas had not yet been scanned or had to be rescanned when the resulting point cloud overlap or quality was not considered sufficient. We were thus able to leave Pul-i Khumri with a data set that had been checked for its consistency and quality. However, we have to note that even with our scaffolding it was not possible to reach the higher parts of the relief in a satisfactory way and that most of the horizontal surfaces set above the actual level of the eye of the scanners could not be scanned. We thus have a final 3D model (Fig. 11, bottom) that is as complete as was possible in our working conditions but with holes that should have been filled by scans done from a higher levels. These holes should be patched in the future by complementary scans or by hand modelling in a 3D commercial package.

However, in conclusion about 90 % of the surface of the relief was scanned in 3D during six days on site, with a scanning access time of only two full working days. The resulting model is a unique tool to preserve the topological information concerning the surfaces of the sculptured niche. It gave us unprecedented insight into the composition of the sculpture and enabled us to consider aspects that it was not possible to feel when in close contact with the monument. We also have to consider that the complete model can enable us to print in 3D an exact copy of the relief at 1:1 scale for a museum exhibition or at smaller scale for its dissemination and study. The use of other digital formats such as octrees should enable its easy dissemination over the web, using a free viewer running on any computer around the world.

While it has to be stated that the scanning operation was made more complex and difficult by the location of the Rag-i Bibi relief and its three-dimensional reality, it should be noted that this technology could be applied with advantage to other flatter reliefs, such as the monumental rock reliefs of the Sasanian rulers. These might soon find other amazing parallels in the mountains of Afghanistan.

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