

Description of military apparatus in the *Śrī-kālacakra-nāma-tantra-rāja*

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Abstract. In the *Śrī-kālacakra-nāma-tantra-rāja*, a Buddhist treatise from the first half of the 11th century, there is a thematic fragment containing a description of military apparatus and their use in battles. In this article, the point of view that we are really dealing with a description of military apparatus and not with a symbolic description of the psychophysical practices of Buddhist yoga is developed. In our point of view, the reason for the subject of war being represented in this Buddhist work should be searched for in the reality of the tragic times in which the text was made—the times of destructive raids made on India by the ruler Mahmud of Ghazni. The article classifies the military apparatus mentioned in the *Śrī-kālacakra-nāma-tantra-rāja*, describes the basic technical characteristics of these mechanisms, and considers their function. The given subjects are considered with the drawing in the commentary *Vimalaprabhā* (11th century) and commentaries by Tibetan scholar Buton Rinchen Drub (1290–1364).

Śrī-kālacakra-nāma-tantra-rāja (The Lord of Tantra Named ‘The Shining Circle of Time’) is the treatise of the Buddhist doctrine Tantra Kālacakra.¹ According to tradition, this text was created in the sacred Buddhist land Śambhala.² The treatise (written in Sanskrit) is built as a dialogue between the Śambhala King Yaśas and the head of the sages of this land, Sūryaratha. Yaśas retells Sūryaratha the summary of the treatise *Paramādibuddha* (The highest primordial Buddha). Kālacakra tradition supposes that the treatise *Paramādibuddha* (also mentioned as *Mūla-tantra* (Root Tantra)), which is not extant, consisted of 12,000 verses and was a record of the Tantra

¹ The term tantra (loom, base [of fabric], essential part, model, system, doctrine) names a class of religious systems (which appeared in Buddhism and Hinduism from the second half of the 1st millennium AD to the beginning of the 2nd millennium AD) and is used as a general name for the base texts of these systems. The Kālacakra (circle of time) system was founded in India in the beginning of the 11th century and is the most recent Buddhist Tantra. In the 11th century, the Tantra Kālacakra spread to Tibet and the Mongol lands when those areas embraced Buddhism. Kālacakra doctrine is one of the most significant religious systems of Indian and Tibetan Buddhism, and it became the base of the chronology (60 year cycles) and eschatology (Buddhist Śambhala legend) of Buddhist Central Asia. In Tibet and Mongol lands, the Tantra Kālacakra remains to this day. Traditionally in Russia this doctrine is presented in Buryatia and Kalmykia.

² Śambhala is a Buddhist sacred land that is reputed to be inaccessible to common people. The leaders and all the people of this land are depicted as mighty yogis practicing Tantra Kālacakra. Buddhist Śambhala legend was incorporated in Buddhist writings in the following timeframes: Indian (11th century), Tibetan (11th–20th centuries) and Mongol (18th–20th centuries).

Kālacakra sermon that Buddha Śākyamuni delivered at Śambhala King Sucandra's request. Sucandra is considered the author of the *Root Tantra* and a direct agnate ancestor of Yaśas (King's Yaśas of Śambhala is the eighth after Sucandra). Only one fragment (*Sekoddeśa*) and a few quotations of this work are extant. Though we have not got the complete text of the *Paramādibuddha*, its summary, the *Śrī-kālacakra-nāma-tantra-rāja* (further called the *Brief Tantra*),³ is the main text of the Kālacakra system.

Tradition says that the *Brief Tantra* was brought to India in 1027⁴ (supposedly one or several Buddhist yogis from India had been to Śambhala and brought the doctrine of Kālacakra and its texts from there). Science supposes that the *Brief Tantra* was written in the first half of the 11th century (perhaps it already existed in the spoken language beforehand). If we put the mythological veil (in which the Kālacakra tradition wraps the *Brief Tantra*) to one side, we can find in it a great number of the valuable details telling us about different sides of Indian life at the beginning of the 11th century, including an important part of the nation's life—the military.

Important help for interpreting the *Brief Tantra* is contributed by the work *Vimalaprabhā* (Pure Light)⁵ (12,000 verses), which was created in India at the same time as the written form of the *Brief Tantra*⁶ and comments on it.

The period of Indian history that is mentioned above was the time of the destructive Moslem invasions, among them the forays of the ruler Mahmud of Ghazni. His last campaign took place in 1027. The need of unity in society and national consciousness grows in the tragic times of military invasions and the following disasters. People try to rally around common ideals and if they cannot physically defeat the conquerors, they look for an internal base for resistance and keep searching for resources for the external resistance. Kālacakra doctrine synthesized different Buddhist traditions and absorbed many ideas of Hinduism. It became one of those spiritual citadels giving a new religious base for unity. Eschatological ideas (about the last times and the end of the world) spread widely during such times. Eschatology runs through the Tantra

³ *Laghu tantra* (Brief Tantra) (Tib. *Bsdus rgyud*)—the concise title of this work accepted by tradition.

⁴ Cetan Shabdrun, et al. 1993, 3214).

⁵ According to tradition, the author of the *Vimalaprabhā* is Śambhala King Badma Garbo (Tib. *Pad ma dkar po*, 'White Lotus'), Yaśas' son. In this article, the Tibetan xylographic edition of the Tibetan translation of the *Vimalaprabhā* (*Bsdus pa'i rgyud kyi rgyal po dus kyi 'khor lo'i 'grel bshad rtsa ba'i rgyud kyi rjes su 'jug pa stong phrag bcu gnyis pa dri ma med pa'i 'od ces bya ba bzugs so*) is used (volumes ka, kha, ga from the author's collection) (further—VP ka [kha or ga]). This edition is supplied with comments made by Buton Rinchen Drub (1290–1364), the famous Tibetan scholar and expert in Tantra Kālacakra. The comments are printed in small print and put in the corresponding parts of the *Vimalaprabhā*.

⁶ In respect to the time of appearance of the *Vimalaprabhā* in India, tradition points to the same date as that of the *Brief Tantra*—1027 (Cetan Shabdrun, et al. 1993, 3214).

Kālacakra and it led to the Śambhala legend. Over 1000 years of being, this beautiful legend has become a part of not only Indian culture, but also the culture of Tibet and Mongol lands. The *Brief Tantra* tells about the eschatological battle of Śambhala.⁷ In addition, the *Brief Tantra* gives guidelines for real war operations. The appearance of these directions in the Buddhist text⁸ discouraged the subsequent (13th–20th centuries) Tibetan commentators of this text, and they tried to interpret them from a symbolic angle.

Concerning this subject, J.R. Newman, a researcher from the United States, gives the opinion of the famous Tibetan scholar Mhas grub dge legs dpal bzang (1385–1438), who says that these military apparatus are intended for kings who are Bodhisattvas⁹ but are not explained in detail because they could be quite destructive if used in the wrong way. Mhas grub dge legs dpal bzang, according to Newman's opinion, also says that some researchers consider these mechanisms in relation to the completion stage,¹⁰ but he himself does not accept this point of view. Mhas grub dge legs dpal bzang thinks that these mechanisms should be understood word for word. He likens them to various 'common miraculous powers' (Tibetan, *thun mong dngos grub*),¹¹ which are explained by Buddhist authors word for word.¹²

In our judgment, the instructions for the war operations in the *Brief Tantra* should be considered in the context of the tragic time in which the text was created. Even the fact of the appearance of the *Brief Tantra* in 1027 may be directly connected with the destructive invasion of the ruler Mahmud of Ghazni in 1027: bearers of knowledge (including military specialists) died and the additional protection of knowledge

⁷ The first chapter of the *Brief Tantra* (verses 161–169) contains a prophecy about a future great battle in which the army of Śambhala headed by King Raudra-Kalkī will defeat the powers of darkness that control the world, personifying all that is stagnant and evil in it. According to recalculations made by Tibetan monks in the second half of the 20th century, the battle of Śambhala will take place in 2424 (Cetan Shabdrun, et al. 1993, 2690). In the second chapter of the *Brief Tantra* (v. 48–50) this eschatological battle is also considered on the inner level—as a battle between the virtues and moral and mental defilements of man taking place in his consciousness and body in the last 24 hours of his life. It is also specially pointed out (ibid., v. 50) that the outer battle of Śambhala should not be considered as illusory.

⁸ Ahimsā ('doing no harm') is one of the main theoretical and practical Buddhist principles.

⁹ A bodhisattva is someone who, coming to realization of achieving the state of Buddha (the final exit from the circle of a births), stays in this world to help other people.

¹⁰ This means that they consider the description of these mechanisms a symbolic description of the psychophysical techniques of the completion stage (*sampannakrama*)—the final stage of Buddhist yoga.

¹¹ Siddhi (realization, achievement) shown in this world (flight, going through objects, and so on), the lower of the two types of Siddhi (the higher being supernatural ability, gained, as it is considered, by yogis).

¹² Newman 1987. This work by J.R. Newman contains an incomplete preliminary translation to English of the first chapter of the *Brief Tantra* and first chapter of the *Vimalaprabhā*. In our work, we investigated this translation.

was needed—its fixation in written form. The written form provided new (wider) possibilities for the treatise to be used as a study guide,¹³ including the actual military aspect.

The text of the *Brief Tantra*¹⁴ consists of five chapters that have 1047 verses.¹⁵ The first chapter, which has 169 verses and is dedicated to a description of the external world, includes a 55-verse thematic fragment (v. 94–148) dedicated mainly to war themes.¹⁶ The first part of the fragment (v. 94–126), tells about *svarodaya* (sort of an astrological system) for the successful waging of war: what the astrological parameters of the time favourable for the destruction of enemies in a battle are, etc. We will not consider this astrological part of the treatise here, but we will mention that it contains instructions directly connected with conducting military operations, and neither the text itself nor the comments to it (*Vimalaprabhā*, commentaries by Buston Rinchen Drub) give us the basis to interpret these instructions in a symbolic respect. The second part (v. 127–148) of the ‘military’ fragment of the *Brief Tantra* contains the descriptions of mechanisms¹⁷ and guidelines for their use.

The *Brief Tantra* has signs of abridgment; according to the tradition of that time, some verses have been deleted. The total text became ‘fractured’, and interpretation was hampered. This has happened to this ‘military’ fragment. The text of the *Brief Tantra* contains indications that only a small part of the original descriptions of the weaponry was left in the text (*Bsdus rgyud* 1966, 93). After the abridgment, the presentation of each mechanism consists of 1–2 verses (5 maximum), which is not enough to use these descriptions to create engineering drawings.

Within the scope of this article, we intend to describe the basic technical characteristics of the weaponry mentioned in the *Brief Tantra*¹⁸ and consider the functioning of these military apparatus.

Eleven types of mechanisms are described in the part with a technical topic in the first part of the *Brief Tantra*: 1) ‘stone [throwing] mechanism’ (*rdo’i ‘khrul ‘khor*, VP ka, 162 a); 2) ‘water apparatus’ (*chu’i ‘khrul ‘khor*, VP ka, 163 a); 3) ‘air apparatus’ (*vāta yantra*, ŚK 1966, 338; *rlung gi ‘khrul ‘khor*, VP ka, 164 a); 4) ‘knife mechanism’

¹³ With some restrictions. More will be said later about the protection of the meaning of Tantric texts by the adherents from the uninitiated.

¹⁴ In this article, translations from the *Brief Tantra* are made from the text of the Sanskrit original (ŚK 1966, 332–78) and from its Tibetan translation (*Bsdus rgyud* 1966, 53–331).

¹⁵ In the Sanskrit text of the *Brief Tantra* (ŚK 1966, 332–78). The Tibetan text (*Bsdus rgyud* 1966, 53–331) has 1041 verses.

¹⁶ A number of verses in this fragment do not touch on themes of war.

¹⁷ In the Sanskrit text of the *Brief Tantra*, the term *yantra* is used with the meaning ‘mechanism’. In the Tibetan translation of the *Brief Tantra*, the term *‘khrul ‘khor* (magic wheel) is used in place of the term *yantra*. Tibetans commonly use this term for any mechanism.

¹⁸ Not going into details, too discrete and incomplete in the text.

(*gri gug gi 'khrul 'khor, VP ka, 164 b*);¹⁹ 5) 'vajra-tent' (*rdo rje'i gur, VP ka, 164 b*);²⁰ 6) 'iron arrow mechanism' (*lcags mda'i 'khrul 'khor, VP ka, 164 b*); 7) 'underground sword mechanism' (*sa 'og gi ral gri'i 'khrul 'khor, VP ka, 165 a*); 8) chariot (*ratha, ŚK 1966, 338; shing rta, VP ka, 165 b*); 9) 'the palace of the Gods or house (cart) of kings, moving for sightseeing' (*lha rnams kyi gzhal yas khang ngam mi bdag rnams kyi ltad mo la bskyod pa'i khyim, VP ka, 167 a*); 10) 'carrousel-vehicle for the spring festival' (*dpyid kyi dg'a ston gyi slad du 'khor lo'i khyogs, VP ka, 167 b*); 11) 'water drawing mechanism' (*chu gcu pa'i 'khrul 'khor, VP ka, 168 b*). The last three mechanisms (v. 145–147) are not connected with war and will not be discussed in this article.

The *Vimalaprabhā* verses corresponding to the technical fragment of the *Brief Tantra* give names to the mechanisms (the *Brief Tantra* mostly denotes them just with the term *mechanisms*) and phrase their functional settings, elements of structure, sizes of some parts, taking into account varieties of mechanisms (if they exist). Two traditional Indian measurements of length are used in the *Brief Tantra* and *Vimalaprabhā*: hasta (cubit \approx 45 cm.) and *āṅgula* (finger [the breadth of finger] \approx 1.9 cm).²¹

Descriptions in the *Brief Tantra* often give numbers not literally, but allegorically (in the entire text of the *Brief Tantra*, not only in the technical part). For example the number 12 is denoted by the expression 'generating day' (the image of the sun in this metaphor refers to the 12 months of the year or 12 signs of the zodiac), the number 4 is denoted by the concept of yuga (there are four world ages), the number 2 is denoted by the word *hand* (left hand and right hand), etc. This device apparently mystifies the text, perhaps to protect it from the uninitiated²², or it could have been a tribute to the tradition of literature at that time.

Pertaining to the descriptions of the military mechanisms, allegory could have been used so that enemies, even if they appropriated the text, would have no chance of understanding how the mechanisms were constructed and would not be able to build them. Not only quantitative characteristics are done allegorically in the *Brief Tantra*. For example, in verse 141 a knot of a mechanism is called 'the moon' (*candra*), and the corresponding part of the *Vimalaprabhā* says that it is in 'cryptic language' (*gsang ba'i skad* (VP ka. 165 b).

¹⁹ Though in the description in the *Brief Tantra* the sword (*ral gri*) is used in the combat part of the machine, the name of the machine mentioned in the *Vimalaprabhā* contains the word *gri gug*, which denotes a specially shaped knife.

²⁰ *Vajra* (mighty, firm) is thunderbolt (lightning) in Indian mythology. As indestructible, adamant, or durable, it is often used in Indian literature as an epithet.

²¹ 24 *āṅgula* = 1 *hasta*.

²² Adherents of the Buddhist Tantra believe that it is a secret doctrine. Even after a Tantric treatise is recorded in writing (with the consequence that more free access to this treatise is provided), adherents of this Tantric system keep the oral tradition of comments to this treatise and believe that its true sense is not clear without this tradition of oral commentary.

All military apparatus described in the *Brief Tantra* should be divided into three groups: 1) mechanisms for reaching and destroying enemy citadels; 2) mechanisms for defence of one's own fortifications and buildings; 3) mechanisms for destroying the enemy's manpower fighting beyond fortifications. In turn, the first group consists of three parts: 1.1 mechanisms for destroying and carrying fortifications on a plain; 1.2 apparatus for reaching water fortresses; 1.3 apparatus for destroying mountain citadels.

Some from these mechanisms have three sizes (large, medium, small).

Three of the mechanisms ('stone [throwing] mechanism', 'knife mechanism', and 'underground sword mechanism') are fixed during battle, and the others are mobile.

What combat troops these mechanisms belonged to is an interesting question. The *Laws of Manu* contain a description of the ancient Indian army (the extant written version was created in the early centuries AD, and this description can be applied to the 11th century AD also). According to the *Laws of Manu*, the structure of the army is divided into six parts: elephants, cavalry, chariots, infantry, command and engineers (Struve 1941, 400). A slightly different structure is given by a Greek historian describing Chandragupta's (the founder of the Maurya Empire) army, which fought against Seleucides (one of Alexander the Great's successors) in 312 BC. There are four main ranks: elephants, cavalry, infantry, and chariots—and two others: transport and accessorial ranks and the fleet (ibid., 417). That the 'water mechanism' (the ship) and chariot belonged to army ranks are evident. The other mechanisms belonged to the engineer or the accessorial ranks.

The beginning verse of the technical passage in the *Brief Tantra* (verse 127) gives a general tactic for destroying the enemy's fortress and defending one's own positions with mechanisms: 'If the [enemy's] army that lost the day immediately goes into a fortress, you build the mechanisms beyond [the fortress] and with a constant stream of flaming arrows and falling stones, mechanisms which hack with the sword and other ways, marquees and tents on the ground, you reduce this fortress to dust and in a few days outfight these wicked enemies' (*Bsdus rgyud* 1966, 87).

The *Vimalaprabhā* comments on this verse: 'now the mechanisms for destroying the wicked enemy's fortress are explained' (*VP ka*, 161 b). It is also said: 'the mechanisms that hack with the sword and other ways defend their own house [military installations—A.S.] (ibid.). The mechanisms described in verse 127 are separately detailed below. In the following verses of the technical passage, only the mechanism that throws 'flaming arrows' does not appear. Either its description was in the abridged part of the *Brief Tantra* or the 'flaming arrows' are just a type of arrow for the 'iron arrow mechanism'.

1.1 Mechanisms for destroying and carrying fortifications on a plain

For this aim, two types of weaponry are allotted: ‘stone [throwing] mechanism’ and ‘vajra-tent’.

The ‘stone [throwing] mechanism’ (v. 128–32)

In the *Vimalaprabhā* comment, this mechanism is described as a ‘mechanism for [throwing] stones at a walled fortress on a plain’ (VP ka, 162 a).

The base of the stone-throwing mechanism is constructed of four tetrahedral piles joined with cross-pieces: four cross-pieces at the front, four on the left, four on the right, one on the back (at the bottom). The cross-pieces are fixed by cavities to the piles. The *Vimalaprabhā* tells about three types of this mechanism: large, medium, and small. According to the size, the length (in hasta) and thickness (in aṅgula) of the base piles diminishes from the large to the small mechanism: 16×16, 14×14, 12×12. The length of the projectile lever for the big mechanism is 14 hasta. The linear dimension of the base (apparently for the big mechanism) is 10 hasta, and the linear dimension of the upper part is 5 hasta. It is written that about 50 ropes are affixed to the top of the projectile lever and are pulled by the ‘drawings’—the soldiers who make the throw. Nothing is said about the weight of the stone or the range of the throw. Apparently the range was fixed for each type of mechanism, and the size of the mechanism was chosen according to the distance between the stone thrower and the objective. Some aiming mechanism which is called ‘line of Brahma’ (*brahma rekhā*) is described. It allows the destination of the throw (left, right, to the centre) to be estimated with the help of some supports put in the inside of the mechanism: ‘the stone falls as you like it to according to the three-way move²³ to destroy the fortress’ (*Bsdus rgyud* 1966, 89).

From the description, it appears that this mechanism was stationary. It was likely constructed from parts that were carried with the army by the engineering or transport troops during redeployments.

The action of the mechanism is described: ‘the dart of the forceful “drawings”—the unshackled stone goes up to the sky fast and then abruptly falls. It completely destroys the top buildings and the bastions [under them] and goes into the ground, as definitely as the *vajra*’ [thunder bolt or lightning—A.S.] (*Bsdus rgyud* 1966, 88).

The description of the stone thrower ends with verse 132: ‘An elephant stricken with this [stone] immediately falls. What about small creatures? [The stone mechanism] destroys the all the enemy’s troops in the top buildings of the fortress

²³ ‘The ability of the three-way move—left, right and centre’ (VP ka, 163 a).

and those who are beyond [the buildings]. In a battle with a fortress on a plain, what archers can compete with it? Enemies who hide in their fortress and are attacked by this mechanism find themselves in the mouth of the lord of the dead' [Yama—A.S.] (*Bsdus rgyud* 1966, 89).

‘Vajra-tent’ (v. 138)

The description of the mechanism says: ‘On wheels is a big house made of iron and wood. It is fully covered with boards and cowhides, and it is round. Propelled by people, [it] makes the ditch as passable as plain ground. When the moat is crossed, soldiers immediately get to the wall and the bank of the fortress’ (*Bsdus rgyud* 1966, 90).

The *Vimalaprabhā* says only this: ‘Concerning the “vajra-tent”, there is no full explanation’ (*VP ka*, 164 b). The term *vajra* (firm) shows the toughness of the mechanism build of wood, iron and cowhides. ‘Tent’ indicates that the function is to cover the soldiers who are moving the mechanism. The description clearly shows that the combat function of the mechanism (which is apparently reminiscent to a steamroller) is to cross a moat.

1.2 Apparatus for reaching water fortresses

The ‘water apparatus’ is designed to deliver the army to fortresses across water.

The ‘water apparatus’ (v. 133, 134)

In the *Vimalaprabhā* comment to verse 133, the combat function is defined as a ‘water apparatus for carrying a water fortress’ (*VP ka*, 163 a).

A ship is being referred to. Verse 133 gives the different types of water devices having different numbers of cabins: 6, 8, 18 or 36. The *Vimalaprabhā* adds: ‘or the apparatus has twofold [$36 \times 2 = 72$ —A.S.] [number of] cabins. For a great sea conquest, there can be as many as 1,000 cabins’ (*VP ka*, 163 b). It is mentioned that all the cabins are pressurized. The grooved-and-tongue-and-grooved jointconnection of a boardsplanks and the additional use of tanned felts and waxed fabric are described. One can therefore speak about the ‘unsinkable technology of the unsinkability of the ship’: it consists of detached waterproof cabins (cells). The *Vimalaprabhā* comment to verse 133 mentions another classification for ships—the type of creatures being conveyed. Three types are mentioned: elephants, horses, and people. For each type of ship, the needed thickness (in *aṅgulas*) of the keel beam is indicated: 24, 20, or 16.

Verse 134 shows two ways of propelling the ship: ‘holding oars’—the oarsmen (at the back of every ship there are six oarsmen²⁴, so 12, 30, and eventually 100’) (*VP*

²⁴ Concerning this verse, Buston comments that six oarsmen are on a ship with six cabins (*VP ka*, 164 a).

ka, 164 a) ‘they move the apparatus or [it] is moved by the wind—wind balloons the silk affixed to the cavities in the piles [i.e. masts and yards—A.S.]’ (*Bsdus rgyud* 1966, 89). The verse ends with the words: ‘The troops went upboarded them [ships—A.S.] and sailed across the sea to destroy the water fortress’ (*Bsdus rgyud* 1966, 89).

1.3. Apparatus for destroying mountain citadels

The function of the ‘air apparatus’ is to destroy mountain citadels.

The ‘air apparatus’ (v. 135, 137)

The *Vimalaprabhā* comment on verse 135 explains the aim and the use of the device in combat: ‘air apparatus dropping flaming oil to destroy a mountain fortress’ (*VP ka*, 164 a).

Verse 135 says: ‘One should bind a pillar a piece of silk that is moved by the wind to a four-cornered frame and pillar with flags. People draw [the mechanism] from behind [the fortress], and [it] goes up from the ground with the rope. With the wind it comes above the fortress. By the flaming oil dropped from it, the enemy’s army and fortress—all that—is burned up’ (*Bsdus rgyud* 1966, 89–90).

The *Vimalaprabhā* comment on this verse says that the rope is as long, as ‘the height of the mountain fortress’ (*VP ka*, 164 b) and that the mechanism ‘carries the oil for burning and one man with the fire’ (*Ibid.*).

Verse 137 says: ‘The air mechanism being pulled from their own place by the rope ascends into the sky. Above the fortress and all the enemy’s buildings it goes, moved by the rope. The length [of the rope] on the ground is specified by reaching the top of the enemy’s fortress. Assembled on the top, [the mechanism] gifts fire to the enemy’s houses and meeting places’ (*Bsdus rgyud* 1966, 90).

So we have the description of a kite that can carry one soldier and a certain cargo of inflammable liquid. In theory, this kite could be built. But the practical realization of the entire combat operation—the accurate insertion of the kite carrying the soldier and some oil above the fortress and its effective use by the method described would seem to be extremely difficult to achieve. The *Brief Tantra* guidance for destroying mountain fortresses seems to be very spectacular, but not effective.

2. Mechanisms for the defence of one’s own fortifications and buildings

This class of weaponry consists of ‘the knife mechanism’ and ‘the underground sword mechanism’.

The ‘knife mechanism’ (v. 136)

About the mechanism described in verse 136 the *Vimalaprabhā* says only: ‘The knife mechanism can be understood by watching [it] directly. The verse also describes [it] comprehensibly’ (*VP ka*, 164 b). The apparatus consists of a vertical axis and two wheels—the top and the bottom. The bottom wheel propels the mechanism and apparently has vanes (Buston Rinchen Drub points out that the bottom wheel is moved by water or wind) (Newman 1987, 557). In the upper part of the mechanism one or several swords are fastened. ‘The sharp sword circles fast by circling of the base of the mechanism’ (*Bsdus rgyud* 1966, 90) and hacks everybody in the zone that it covers.

The ‘underground sword mechanism’ (v. 140, 141)

The *Vimalaprabhā* comment on verse 140 explains the combat function of the mechanism: ‘Now the mechanism of the underground sword for the defence of the king’s palace is clear’ (*VP ka*, 165 a).

Two tetrahedral piles 4 hasta long and 12 aṅgula thick are put in a pit so that half of the pile is underground and half inside the pit. A disc that fixes the haft of a sword is put in the middle of the ropes looped around the piles. By the disc circling the ropes are twisted (so the energy accumulates) and the sword is fixed by a special breech block called ‘the moon’. The trigger of the breech block is put on the boards covering the pit. ‘The man who steps on top of “the moon” is immediately hacked by the sword. From the border of the fortress gates to the king’s palace, [this] mechanism is the only weapon’ (*Bsdus rgyud* 1966, 91). Apparently the sword taken off the breech block comes untwisted and appears (from the prearranged slot) above the ground. The *Vimalaprabhā* emphasizes the necessity of placing the great number of these mechanisms on the main way from the gates of the fortress to the king’s residence (*VP ka*, 165 b).

The ‘underground sword mechanism’ represents the kind of underground ‘mechanical trap mine’ and can be used many times (after the mechanism actuates it can be reset).

3. Mechanisms for destroying the enemy’s manpower fighting beyond fortifications

For this function there are two types of weaponry: the ‘iron arrow mechanism’ and the chariot.

The ‘iron arrow mechanism’ (v. 139)

The *Vimalaprabhā* defines the function of the mechanism: ‘Now the mechanism

of the iron arrow for striking²⁵ the elephant encased in armour in battle is clear' (*VP ka*, 164 a).

Verse 139 says: 'Two pintles on the support fix the bow string to the bow immovably. Two iron pintles on the back part of the mechanism hold the axle, which has a partially bent fingerlike attachments [hooks—A.S.]. In battle the bow string on the tips of the 'fingers' delivers many equal arrows or sharp iron arrows that pierce an elephant encased in armour and run [it] through' (*Bsdus rgyud* 1966, 90–1). Here we have a description of an arbalest (perhaps the first in history). Arrows here apparently mean common arrows and iron arrows—special arrows for the arbalest. 'Equal' may be used because the mechanism needed standard-sized arrows. The impact of the arbalest, which allowed arrows to down the most forceful troops in the Indian army—elephants encased in armour—was achieved due to the very taut bow and mechanical chamber-type trigger. From this description we cannot conclude whether this mechanism was stationary or mounted on wheels, but the latter is possible.

The chariot (v. 142–4)

Battle chariots were the main combat force in the ancient and medieval Indian army. It was glorified in many Indian writings of that time. The chariot was a privileged type of arms; chariots were used by Kṣatriyas (representatives of the hereditary military class to which the king's clansmen belonged).

The *Vimalaprabhā* comments on verse 142 thus: 'The characteristics of the chariot for the king's family in the battle are clear' (*VP ka*, 163 a). The king's family is called Kṣatriya's varṇa here.

The first criterion for the classification of chariots (verse 142) is the type of animal used to draw the chariot, horse or elephant. 'The gauge of the chariot drawn by elephants is twice the gauge of the chariot drawn by horses. The same concerns wheels, seats, slats, distinctions, and other things' (*VP ka*, 167 a).

It is said that the durable axle is the first detail to be made, then the wheels. The wheel is the base element of the construction; its size affects the sizes of other details of the chariot. The size (diameter) of the horse chariot is 2.5 hasta. The length of the axle equals four diameters of the wheel. On the platform of the chariot, open seats for riders or lodgings are organized.

The second classification of chariots (v. 142) is into 'even' (*sama*) chariots or 'odd' (*viśama*) chariots. An 'even' chariot is drawn by an even number of horses or elephants, and 'odd' chariot is drawn by odd number. The even ones may have two, four, or six animals, and the odd ones may have three, five, or seven.

²⁵ Literally 'transfixion'.

The third criterion for the classification of chariots is the type of ‘lotus’ (*padma jāti*) and the type of ‘joy’ (*nandi jāti*). This is introduced in verse 143: ‘The gods’ [chariot] is the “lotus” type, and that made by the son of god is the “joy” type, the people’s [chariot]’ (VP ka, 166 a). The *Vimalaprabhā* elucidates: ‘The “lotus” chariot that belongs to the gods is round. The one that is called “made by the son of god” chariot of Arjuna²⁶ belongs to the “joy” type; it is four-cornered.²⁷ The chariot made by other people is also four-cornered and belongs to the king’s family’ (VP ka, 167 a). So the *Vimalaprabhā* actually segregates the people’s chariot (chariot of the Kṣatriyas) as a detached third type for ‘the king’s family’, though the shape of its carriage (the shape is the base of this classification) is the same as the one of the ‘joy’ chariot. The *Brief Tantra* (as it follows from the given quotation) states that the people’s chariot belongs to the ‘joy’ type.

Verse 144 gives the fourth classification of the chariots, which is based on the number of axles and wheels. There are three types of chariots: ‘great’ (*mahā*), ‘half’ (*ardha*), and ‘even’ (*sama*). The ‘great’ chariot has four axles and eight wheels. It is written that the ‘great’ chariot ‘cannot be turned to flee in battle’ (ibid.). The ‘half’ chariot has two axles and four wheels. The ‘even’²⁸ chariot has one axle and two wheels.

Conclusions

After King Yaśas ended the descriptions of the mechanisms and methods of their use, he appealed to Sūryaratha with this admonition, which ends this thematic segment of the *Brief Tantra*: ‘The teacher of three worlds [Buddha Śākyamuni—A.S.] in the form of the Primordial Buddha (*paramādibuddha*) explained these things to Sucandra before to subdue the wicked and to be triumphant on the glorious land. I showed you clearly a little part of this land [Śambhala—A.S.] today. Use it to defend without anger and passion your own place,²⁹ oh Sūrya [Sūryaratha—A.S.]!’ (*Bsdus rgyud*, 1966, 93).

This appeal of Yaśas aggregates the realistic look at the actuality, which includes angry methods of fighting with evil and injustice in this world³⁰—and true

²⁶ Demigod, hero of the *Mahābhārata*.

²⁷ The matter is the shape of the carriage body.

²⁸ The name ‘even’ (*sama*) is the same as the type of chariots moved by an even number of animals, but the classification characteristic differs.

²⁹ In the mythological context of the *Brief Tantra*—Śambhala, in the historical context—India.

³⁰ Pacifism in its idealistic version is not represented in Buddhism. The basic motivations (mercy to all living creatures and activity for their good) remain, but some ‘angry deeds’ (Tibetan, *drag po’i las*) (up to killing) if other types of acts (explanations, admonitions) fail can take place, depending on the ones who make others suffer.

humanism—the defensive, protective motivation of the military construction and the need of acting without englooming effects such as anger and passion, even when war is needed.

As it seems to us, this segment of the Indian Buddhist treatise of the 11th century is of great value for researching the history of not only Indian war engineering, but also humanity's science of war.

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