A Comprehensive Survey of Rock Art in Upper Tibet
Volume III.1 Stod (Eastern Half)

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Archaeopress Archaeology

Archaeopress Publishing Ltd
Summertown Pavilion
18-24 Middle Way
Summertown
Oxford OX2 7LG

www.archaeopress.com

ISBN 978-1-80327-773-8
ISBN 978-1-80327-774-5 (e-Pdf)

Cover: Brag gdong as seen from the small pass that accesses this part of the north shore of Lake Glog phug mtsho. The small island just offshore on the right side of the photograph is called Rmigs pa mkhar ru (Lizard Castle). The snow-capped mountains visible are part of the range that forms the southern boundary of Ra bang.
Spine: Outline of a horned eagle (*khyung*), inv. no. S65_L53_C1e, Iron Age/Protohistoric period. Cat1010.

Text and photographs by John Vincent Bellezza

Maps by Brian Sebastian and John Vincent Bellezza

Rock art locator diagrams by Brian Sebastian and John Vincent Bellezza

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Acknowledgements

It is with much gratitude that I acknowledge the support of the **Lumbini International Research Institute** (LIRI), who through a generous grant enabled me to compose this volume. LIRI also underwrote copyediting services and helped defray expenses involved in the production of the book. I want to specially thank Dr Christoph Cüppers, the acting Director of LIRI, who has seen fit to assist my efforts in publishing many of the findings I obtained in Tibet. Angela Clyburn once again took it upon herself to digitally enhance hundreds of rock art images using special software. Her efforts proved essential to this work by making some rock art compositions visible to me for the first time and by bringing many others into clearer focus.

As an independent researcher and explorer with little recourse to university and corporate sponsorship, every act of kindness shown to me by friends, colleagues and strangers alike, whether it was material or informational in nature, assumes special significance. Nonetheless, I have enjoyed much intellectual liberty in my quest to elucidate the ancient cultural make-up of Tibet, managing to be free of burdensome teaching assignments and faculty obligations. Operating independently has also allowed me to remain vigilant regarding the pet theories of others and the latest socio-political trends in academia. Yet I am always cognizant that the liberty I have attained is largely empowered by the generosity and goodwill of others.

I am most fortunate to have been guided and befriended by many Tibetans over the course of launching expeditions to uppermost Tibet. This volume is the fruit of fieldwork and exploration in Tibet initiated in 1986, none of which would have been possible without the assistance of literally thousands of shepherds, farmers, monks, scholars, and government officials in Tibet. The drivers, cooks and guides who helped run many of my expeditions often had to endure difficult conditions and they command my respect. Although even those Tibetans whom I remember most must remain unnamed for the time being, their contributions are needless to say much appreciated. I also want to heartily thank the dear friends who accompanied me on expeditions to Tibet. Of special note is the late C. Ashely McAllen M.D., who participated in and helped fund fieldwork in 1999 and 2004–2007. His memory is cherished. Special thanks go out to R. Claire Bellezza who helped make the 1994 expedition to Upper Tibet especially productive and pleasurable. Many friends have offered moral and material encouragement over the decades of exploration and research on which this work rests. It is with much satisfaction that I salute them all. Family members have been steadfast in their support of my labours and have helped me as best they could. Expressing the debt of gratitude owed and affection I have for them is beyond my powers as a writer to express.

Despite any shortcomings in this book, as surely there are, I sincerely hope that all those who have assisted me (directly or indirectly) in writing it will not see their efforts as having been made in vain.

Precis

This volume comprehensively documents rock art in Upper Tibet,[1] the third of five books planned on the subject. Rock art, the alteration of natural rock surfaces as cultural productions, is typically one of the most durable of archaeological assets worldwide. The territory referred to as Upper Tibet in this work occupies much of the western half of the Tibetan Plateau, the highest part of the highest plateau on earth.[2] The Tibetan Plateau is strategically situated in the heart of Asia and covers an area of *c.* 2,400,000 km². To the west and south lies the Indian Subcontinent and Burma, while cultural China occupies the east, and Inner Asian territories are in the north. The pictographs (rock paintings) and petroglyphs (rock carvings),[3] rock art sites, and descriptions and analyses presented in this work are the direct result of intensive fieldwork conducted by the author in Upper Tibet between 1995 and 2016. By organizing rock art, as well as related findings collected on eighteen major expeditions into a single research framework,[4] a coherent exposition of this area of inquiry is achieved. The present volume and others in the series, examine the physical, aesthetic and semantic characteristics of rock art in Upper Tibet. These paintings and carvings are subject to archaeological, historical and ethnographic investigation, which lays the foundation for systematically exploring various questions regarding the role of rock art in forging Tibet's past. As is conveyed here, and in the companion volumes, Upper Tibetan rock art serves as a kind of cultural bridge spanning some 3000 years. Hence this corpus of primary materials is uniquely placed chronologically, enabling the distant past to set the stage for gaining new perspectives on the more familiar Tibetan legacies of later times.

The study of rock art is of much value, for it provides a great wealth of information on ancient settlement and culture in Tibet (as it does worldwide). These paintings and carvings on stone represent a continuous record of habitation and cultural development over a wide swath of the Tibetan Plateau, beginning no later than the Late Bronze Age and continuing until *c.* AD 1400 and even to the present day. The origins of the large fund of rock art in Upper Tibet can be traced back to the Late Bronze Age (*c.* 1200–700 BC) and persisted as an interrelated cultural, regional, and technological expression in the Iron Age (*c.* 700–100 BC) and Protohistoric period (*c.* 100 BC – AD 600). The rock art of this Late Prehistoric era (*c.* 1200 BC – AD 600) is primarily characterized by zoomorphic depiction and close interactions between animals and humans in both hunting and non-hunting contexts. In the Early Historic period (*c.* AD 600–1000), the rock art of Upper Tibet began to chronicle numerous encounters between Buddhist and non-Buddhist religions and sometimes appears alongside Tibetan rock inscriptions. As this book and others in the same series demonstrate, it is in the rock art of Upper Tibet that some of the most widespread icons and symbols adopted by the two Lamaist religions (Buddhism and Yungdrung Bon) first manifested. Yet there was no complete break with the past, and hunting displays and anthropomorphic and zoomorphic portraiture continued to fascinate rock art makers in the Early Historic and Vestigial periods (*c.* AD 1000–1400). The old tradition of carving and painting natural rock surfaces in Upper Tibet, often relying upon pre-established themes and scene architecture, continued until as late as *c.* 14th century AD, before largely disappearing from the archaeological record (Bellezza 2020b). Nonetheless, there is also a smaller body of rock paintings and carvings that belongs to the Later Historic period (*c.* AD 1400–1950), which extends traditional legacies of figuration to within living memory.

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[1] This territory falls under the jurisdiction of the Tibet Autonomous Region of the People's Republic of China. In premodern times, it was part of lands ruled by the Lhasa government (Sde pa gzhung).

[2] West of Upper Tibet, the 'Western Tibetan Plateau' includes the regions of Ladakh and Spiti under Indian jurisdiction, Baltistan in Pakistan, and Transhimalayan areas of Nepal (Humla, Dolpo, Mustang, etc.). There are manifold commonalities in the content of rock art on the Western Tibetan Plateau. Adjacent tracts to the east of Upper Tibet, in what are now the Mtsho nub and Yul shul prefectures of Qinghai province on the Eastern Tibetan Plateau, also share an interrelated physical and cultural environment with the Western Tibetan Plateau.

[3] Pictographs (rock paintings) are also known as cave paintings, cave drawings, rock paintings, and rupestrian paintings. Synonyms for petroglyphs include rock engravings/etchings, and rupestrian carvings/engravings/etchings.

[4] These expeditions were planned and executed by the author, with local residents acting as guides and providing logistical support on a voluntary basis. Friends of the author also accompanied him on several of the campaigns to survey rock art, sometimes participating in its documentation. In expeditions launched after 1998, paid staff was a critical element of most missions. Staff members were engaged in the operation and maintenance of transport vehicles, cooking and other camp chores, and as liaisons with government officials. The expeditions in which rock art was surveyed are as follows: Divine Dyads Expedition, year two (1995), Changthang Phase II Expedition, year one (1997), Changthang Phase II Expedition, year two (1998), Changthang Circuit Expedition (1999), Upper Tibet Circumnavigation Expedition (2000), Upper Tibet Antiquities Expedition (2001), High Tibet Circle Expedition (2002), High Tibet Antiquities Expedition (2003), High Tibet Welfare Expedition (2004), Tibet Upland Expedition (2005), Tibet Ice Lakes Expedition (2006), Tibet Highland Expedition (2006), Wild Yak Lands Expedition (2007), Sky Lake Expedition I (2008), Upper Tibetan Rock Art Expedition I (2010), Upper Tibetan Rock Art Expedition II, year one (2011), Sky Lake Expedition II (2012), and Upper Tibetan Rock Art Expedition II, year two (2013). Each of the expeditions in which rock art was catalogued was between one and six months in length. As well as these expeditions, rock art was documented on two shorter excursions to Upper Tibet in 2014 and 2016.

In addition to Volumes I and II and the present work, two other volumes are planned for this series which, when brought to fruition, will constitute the most extensive survey of rock art conducted in Upper Tibet to date. All five volumes are contracted for publication by Archaeopress (Oxford) and are expected to appear in print over the next two years. The first two volumes are devoted to the rock art of the Byang thang, while the third and fourth volumes examine the rock art of Stod, a region covering the far west of Tibet. This third volume inventories rock art in the eastern half of Stod (pronounced Tö), a 40 km-wide strip of territory that extends across the territory from north to south.[5] Like Volumes I and II, it consists of detailed surveys of rock art and is geographically organized from east to west. In total, more than 11,000 rock art subjects are expected to be inventoried individually through the compilation of standardized sets of data. Basic information on rock art technique, subject identification, thematic class, mode of presentation, physical condition, estimated age, and relative location, etc. are supplied for each piece of rock art. In addition to the datasets, the first four volumes of the series offer rock art site descriptions and assess the cultural, religious and artistic traits of these locations. In each of the inventory volumes, collateral archaeological sites (residential, ceremonial and funerary) are also scrutinized. When viewed in combination with these monumental assets, the social and economic context of rock art production in Upper Tibet comes into sharper focus. The fifth and final volume of the series contains the bulk of the text, a rigorous look at the ideological, technical, chronological, statistical, and cross-cultural comparative aspects of rock art in Upper Tibet. This multi-dimensional framework contributes to an enhanced understanding of the cultural and historical development of the Tibetan Plateau more widely during the Late Prehistoric era and Early Historic period. The synthesis effectuated facilitates a more thorough appraisal of the place of Tibet in the archaeological mosaic of Eurasia. Finally, there are methodological and theoretical discussions planned for the fifth volume, which situate the rock art of Upper Tibet in a broader academic and artistic ambit.

[5] In this work the most widely used system of Roman transliteration of Tibetan terms, which is referred to as modified Wylie, is uniformly employed for consistency and accuracy. Without the degree of linguistic precision offered by the correct rendering of Tibetan terms, the cultural and historical analyses undertaken in this volume and others in the series would be seriously compromised. To avoid unwieldy repetitions, it was decided that phonetic equivalents of Tibetan terms would not be included in the work. However, Tibetan words that have been adopted into the English language (e.g. lama, Lhasa) appear as they do in English. It should be emphasized that the system of transliteration employed in this work differs greatly from Sinicized designations of Tibetan terms that are now frequently used in science publications worldwide. For example, the Tibetan word for lake *mtsho* (pronounced *tsho*) is often written as *co* in technical articles. It is the opinion of the author that the confusion engendered by disparate systems of transliteration is best overcome by embracing Tibetan linguistic traditions.

Section I

General Introduction

Ia. A Geographic, Environmental and Administrative Review

Upper Tibet consists of two major regions traditionally known to Tibetans as Byang thang and Stod.[1] The larger Byang thang (Northern Plains), a sprawling expanse of mountain ranges, basins and plains, occupies the eastern two-thirds of the territory, while the valleys, mountain ranges and badlands of Stod are in the far west. The physiographic boundary between the Byang thang and Stod is not clearly demarcated; rather they overlap as the high tablelands of the former give way to the lower elevation valley systems of the latter. In fact the Western Byang thang is often seen as an integral part of Stod, because it too was, and still is, administered by Mnga' ris (now a prefecture of the Tibet Autonomous Region; henceforth: Ngari). The Byang thang is set north of the two main Transhimalayan ranges. In geographic parlance, these two ranges have come to be called Gnyan chen thang lha (eastern subdivision) and Gangs ti se (western subdivision), which are spelled in a variety of ways in scientific literature.[2] In the west, the northern boundary of Upper Tibet is formed by the Kunlun Mountains, which demarcates sectors of the border between the provinces of TAR (Tibet Autonomous Region) and Xinjiang in the PRC (People's Republic of China). In the east, the northern bounds of Upper Tibet are formed by the Gdang la (Tanggula) range, which divides the TAR and Qinghai provinces. Byang thang is a descriptive geographic term that refers to the topographic characteristics of the region and does not carry weight as political geographic nomenclature. It has often been used by residents of primarily agrarian Central Tibetan (in places such as Lhasa and Shigatse) to mean rather ambiguously the homeland of their stock rearing northern neighbours. This is also the case with Byang, a toponym that refers rather inexactly to the vast northern regions of the herders. From this word comes *byang ba* (northerner), which denotes the herders or *'brog pa* of the north.[3] Although the term Byang thang does not appear to be of very ancient origins,[4] the use of the word Byang to denote some or all of the Byang thang has a long historical pedigree.[5]

This third volume in the series on the rock art of Upper Tibet is dedicated to the pictographs and petroglyphs of the far western portion of Upper Tibet, the region known as Stod. For the purposes of this study, the demarcation of the Byang thang and Stod is fixed around 80.5° E (decimal degrees) / 80° 30' E (degrees and minutes), which more or less coincides with the eastern margin of the agricultural belt that stretches across the lower elevation valleys of far western Tibet. Stod is bounded by the Great Central Himalaya Range in

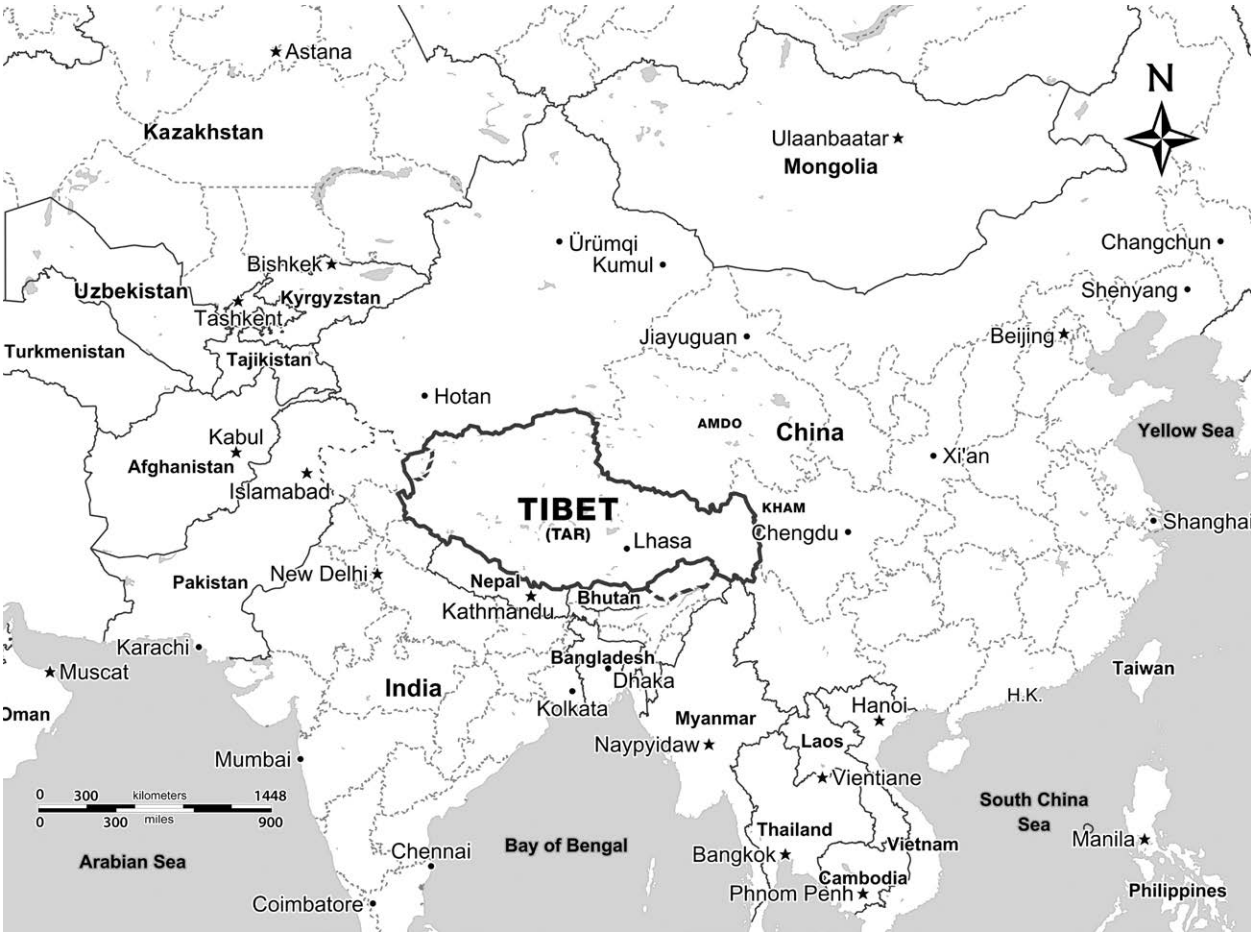
[1] The earliest known documents and inscriptions in Tibetan date to the 7th and 8th centuries AD, where it already appears as a highly sophisticated language that exhibits a mature grammar and syntax and an extensive vocabulary. Clearly the origins of the Tibetan language lie in a much earlier period, having evolved over many centuries. Therefore an understanding of Tibetan is a vital tool in the investigation of the cultural context of Upper Tibetan rock art, especially for that produced after the 7th century AD. According to Tibetan written sources, prior to the 7th century AD and the annexation of Upper Tibet into the Tibetan empire, two other Tibeto-Burman languages were spoken there: Zhang zhung (in the west) and Sum pa (in the east). Extant lexicons in Zhang zhung are scanty and what are purportedly terms of Sum pa language origin occur mostly in Yungdrung Bon liturgical texts. Words and passages in these two languages have been written using the Tibetan script, mostly postdating the 11th century AD, and admit of lexical and orthographic innovations arising subsequent to their use as spoken languages in Upper Tibet, which beclouds their earlier vernacular forms. On the Zhang zhung language, see, e.g. Martin 2010; Hummel 2000; Dagkar 2003: 10–41; Kogan 2021.

[2] In the English language, the Transhimalayan (also Trans-Himalayan) range of Gnyan chen thang lha is frequently rendered phonetically as Nyenchen Tanglha, while the established Chinese spelling is Nyainqêntanglha. The Transhimalayan range of Gangs ti se appears in various forms with Gangdise, Gangdese, and Gangdisi commonly encountered, but also as Gangdisê in pinyin (official system of transliteration used in the PRC).

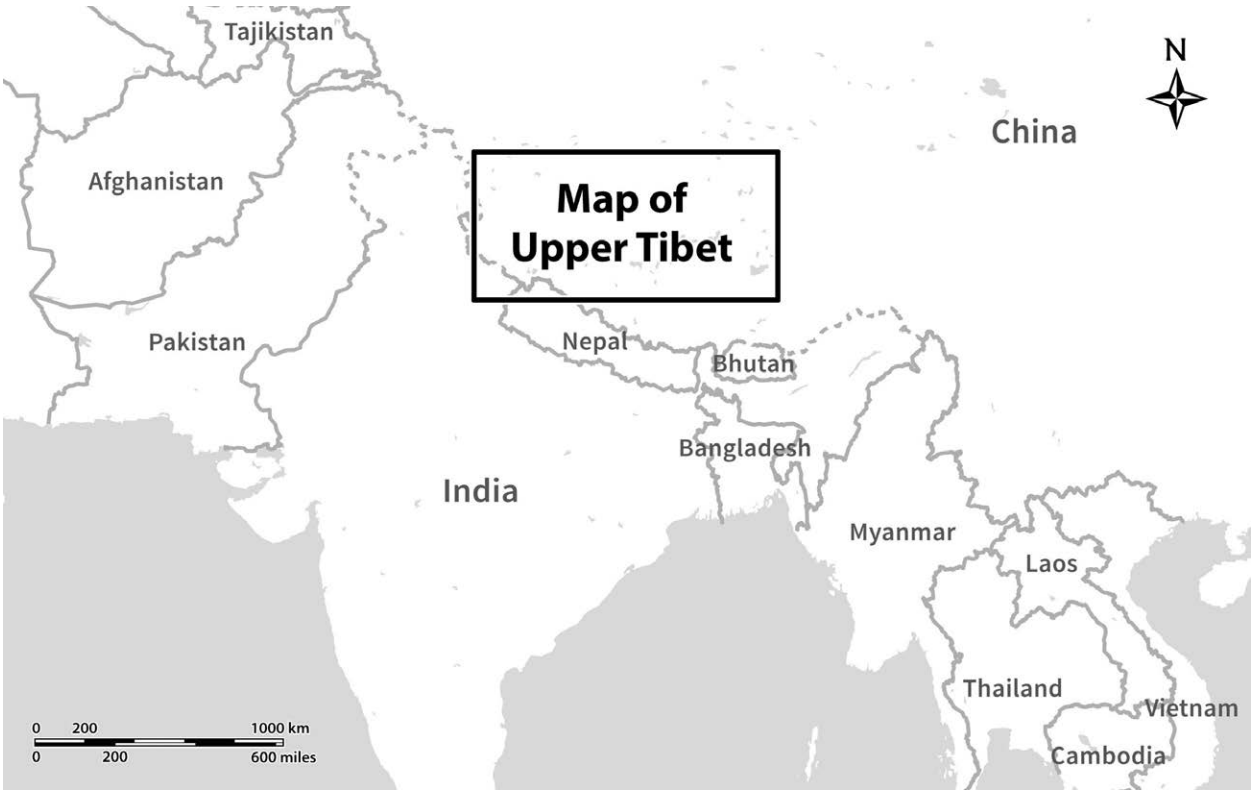
[3] On the culture and way of life of the *'brog pa*, see, e.g. Bellezza 1997; 2014b: 47–73; Norbu 1997; Goldstein and Beall 1990; Ekvall 1968.

[4] The earliest occurrence of the toponym of which we are aware is found in conjunction with royal hunting guides (*sa mkhan*) in the Tibetan historical text Chos 'byung mkhas pa'i dga' ston, composed by Dpa' bo gtsug lag phreng ba (16th century AD). See Bellezza 2008: 244.

[5] One ancient recorded form is Byang 'brog (Pastures of the North/ Wilderness of the North), which is closely associated with the hunting of wild yaks and deer in several Old Tibetan historical and funerary and curative ritual manuscripts dating to the Early Historic period. Another form found in Tibetan manuscripts of the Early Historic period is Byang ka snam brgyad, a region of eight parts (*snam brgyad*, Classical Tibetan: *rnam brgyad)*, which appears to be synonymous with some or all of the Byang thang. On these Old Tibetan terms, see Bellezza 2008: 519, 520; 2010: 69; 2013a: 210, 238, 239. *Byang ka*, meaning 'north' or perhaps more precisely 'expanse of the north', parallels other geographic terminology; e.g. *thang ka* (plain) *sna ka* (prow of a ridge).



Map 1. Map of the Tibetan Plateau and adjoining countries. The TAR (Tibet Autonomous Region) is highlighted in the middle of the map. This region corresponds with what is sometimes called Outer Tibet.



Map 2. The location of Upper Tibet. See Map 4 for site locations.

the south, the Great Western Himalaya and Karakorum in the west, and the Kunlun Mountains in the north. Three major rivers of Tibet and the Indian Subcontinent arise in southwestern Stod and one just to the east in the old district of Gro shod (now part of 'Brong pa County; Bellezza 1993). These rivers are the Indus (Sengge gtsang po), Sutlej (Glang chen gtsang po), Karnali (Rma bya gtsang po), and Brahmaputra (Rta mchog gtsang po/ Yar lung gtsang po). Stod extends west to the frontiers of India and Nepal and north to the PRC province of Xinjiang (East Turkestan). Stod stands on a geographic crossroads, its interactions with surrounding peoples and civilizations adding much to its own cultural development over the millennia. In the south, the territory of Stod is contiguous with the ancient Khasa kingdom of western Nepal; in the southwest, to various erstwhile principalities of Kumaon and Garwhal, in the Indian state of Uttarakhand; in the west, with Kinnaur and Spiti in Himachal Pradesh as well as Ladakh (a union territory in India); and in the north, with the Silk Road cities of Yarkand and Khotan.

The Tibetan Plateau is part of the global cryosphere and has been dubbed the 'Third Pole'. It is the highest landmass on earth and is crucial in shaping the global climate. Due to high elevation of the Tibetan Plateau, it receives much more solar radiation than low-lying areas, which results in extremely powerful land-atmosphere interactions.[6] The Tibetan Plateau is regarded as a key driver in the formation of the Indian summer monsoon. Thermal forcing over the Tibetan Plateau coupled with thermal forcing over the Iranian Plateau produces a heating system that elevates the tropopause and generates a monsoonal meridional circulation over South Asia, creating large-scale conditions favourable for Asian summer monsoon development (Liu *et al.* 2020). The climate of the Tibetan Plateau is generally characterized by strong solar radiation, low average temperatures, stark diurnal temperature differences, and these characteristics are most pronounced on the Byang thang and in Stod. Due to a cline of decreasing temperature and precipitation from the southeast to the northwest, Stod is the most arid region on the Tibetan Plateau and has a cold desert climate with dry winters and most annual precipitation falling between July and September. It is in the intense rain shadow formed by the Himalaya, Transhimalaya and Karakorum ranges. Like on the Byang thang, temperatures can fall below freezing even during the short summer season of around eight weeks. While precipitation on the southeast Tibetan Plateau can exceed 1000 mm, in the arid zone of northwest Stod it is it ranges from 50 mm to 100 mm, but is double or more that in southeast Stod (Chen *et al.* 2022: 425 (fig. 2); Sun *et al.* 2021: 5 (fig. 4)). Due to extreme continentality, aridity and a mass mountain effect, the highest snowline in the northern hemisphere (6200 m) occurs on Ngang lung gangs ri (Han *et al.* 2011: 207), an east-west oriented mountain range that forms part of the border between Ru thog and Dgye rgyas counties. In Stod, minimum winter temperatures reach - 30° to - 40° C, while summers are cool to warm. In recent decades, the Tibetan Plateau has been subject to warming at 2.2 times the rate of the global average, with a greater warming rate in the autumn and winter, increased minimum temperature, and slightly increased precipitation accompanied by more interannual variability (Wang 2020 *et al.*). Glacier retreat has been detected in many areas of the Tibetan Plateau, which holds the largest glacial ice volume in the middle latitudes (Spiess *et al.* 2015; Zhong *et al.* 2019).[7] It is estimated that in the past half-century, 82% of the plateau's glaciers have retreated and 10% of its permafrost has degraded and these trends are expected to continue (You *et al.* 2013). Due to increased precipitation and warming over the last two decades, large-scale remote sensing of vegetation on the Tibetan Plateau shows that plant life has expanded north-westward and this includes into barren lands in northern Ngari (Wang *et al.* 2020). These very recent trends contrast with the long-term climatic record of Ngari. Primarily caused by a reduction in rainfall from the summer monsoon, the pollen record from Lake Spang gong mtsho indicates that grasslands and forests of the mid-Holocene were replaced by montane steppe and steppe-desert, leading to a chronic decline in vegetation cover (Dallmeyer *et al.* 2011:).[8]

The most common Tibetan vegetation types are alpine steppe (grasses and Carex high-cold steppe), alpine meadow {Kobresia and forb high-cold meadow), and alpine sparse vegetation, which are distributed in flat areas and account for 60% of the total area of the Tibetan Plateau (Ni and Herzschuh 2011: 431). Much of the area covered in these vegetation types is found in Upper Tibet. Subalpine dwarf-shrub desert, alpine cushion dwarf-shrub desert, and areas with no vegetation account for an additional 14% of vegetation on the Plateau and are mainly distributed in arid tracts in northern Stod and the Byang thang (Ni and Herzschuh 2011: 431). The vegetation of Ngari is composed of mountain steppe and steppe-desert types in the south in which *Ceratoides latens*, *Ajania fruticulosa* and *Ceratoides compacta* dominate (Chang 1983; 1981), In the northwestern part of Ngari, a high-cold desert

[6] One climate model indicates that without the Tibetan Plateau the northern hemisphere would be 4° C warmer and 10% drier (Yang *et al.* 2020).

[7] Glaciers cover 49,873 km of the Tibetan Plateau (Yao *et al.* 2007).

[8] Discrepancies in the interpretation of changing climatic and vegetation patterns in Upper Tibet between palynological and glaciological studies have created considerable uncertainty. Although mean annual temperature trends remain controversial, well-dated paleo-shoreline sequences and regional lacustrine records generally indicate that lakes have been gradually shrinking since the Early Holocene due to a weakening of the Indian summer monsoon (Chen *et al.* 2020).

prevails with a low suffrutescent component and sparse growths of cryoxeric *Ceratoides compacta* and companion species *Pegeophyton florum* and *Hedinia tibetica* (Chang 1983; 1981). The uppermost vegetation line in Ngari is 5600 or 5700 m, where sparse cushion plants primarily consisting of *Arenaria musciformis* and *Thylaco-spermum caespitosum* grow (Chang 1981). In lower elevation river valleys, the woody shrubs *Caragana versicolor*, *Hippophae rhamnoides*, tamarisk (*Myriacaria davurica*), and wild rose (*Rosa*) thrive. While trees are depicted infrequently in the rock art of Stod and the Byang thang, it is not known whether any of these species are represented. In the lowest parts of Gu ge, near the Indian frontier, certain Mediterranean elements such as *Colutea arborescens* are found (Chang 1981).

The zoomorphic rock art of Upper Tibet is characterized by wild ungulates, large carnivores and birds that are mostly native to the territory. Thanks to its immense wild pasturelands, Upper Tibet once supported large populations of wild yaks (*Bos grunniens*), which are still found in the northern-most tracts of Ngari. This is by far the most common zoomorphic representation in the rock art of Stod and other regions of Upper Tibet. The endemic white-lipped deer (*Cervus albirostris*) and MacNeill's deer (*Cervus wallichii*) are no longer found in the region; however one or both of these species are well represented in the rock art of Stod, including in hunting and predation contexts. Blue sheep (*Pseudois nayaur*) are still fairly common in rocky and mountainous areas and this is reflected in local rock art, but the larger argali has become endangered. A subspecies, the Marco Polo sheep (*Ovis ammon polii*), ranges as far east as the eastern flanks of the Karakorum Range in Ngari. Other large wild ungulates are the Tibetan wild ass (*Equus hemionus*; largest species of wild ass in the world), Tibetan antelope (*Pantholops hodgsoni*), argali (*Ovis ammon hodgsoni*; the largest wild sheep species in the world), and Tibetan gazelle (*Procapra picticaudata*), all of which seem to be represented in the rock art of Upper Tibet. Despite ibexes (*Capra sibirica*) thriving in Ladakh and Spiti, regions adjoining Stod, this animal is not native there. This is borne out by the rock art of Stod, which nowhere features ibexes. Other common but smaller mammalian species, e.g. the Tibetan woolly hare (*Lepus oiostolus*), Himalayan marmot (*Marmota himalayana*), and black-lipped pika (*Ochotona curzoniae*), are little seen in the rock art bestiary.[9] Large carnivores in Stod are the brown bear (*Ursus arctos*), snow leopard (*Panthera uncia*), wolf (*Canis lupus*), and lynx (*Felis lynx*). Large wild carnivores, consisting of indigenous species together with the tiger, are common portrayals in rock art of Stod. The Tibetan sand fox (*Vulpes ferrilata*) and red fox (*Vulpes vulpes*) occur in Stod but they appear to be little depicted in rock art. It is reported that 67 species of birds breed on the Byang thang and 156 species in the far west of Tibet, which are mostly comprised of Palearctic species but with some Sino-Himalayan species as well (Vaurie 1972: 110–144).[10] Black-necked Cranes (*Grus nigricollis*) were counted at 39 lakes in Nagchu and Ngari prefectures (Zhang *et al.* 2015). A wide range of raptors fly in the skies of Stod including those belonging to the families of Falconidae, Strigidae and Accipitridae. Many taxa of birds, especially birds of prey, grace the rock art of Upper Tibet.

It is widely accepted that the formation of the Tibetan Plateau was mainly the result of the collision of the Indian and Eurasian tectonic plates during the Cenozoic and the subsequent subduction of the Indian plate beneath the Eurasian plate.[11] The Tibetan Plateau has had a huge bearing on shaping the global climate and in the distribution of biogeographical zones in Eurasia. The Tibetan Plateau is the youngest example of continent-to-continent collision, subduction and spreading, which was initiated 50–70 million years ago (Liu *et al.* 2019). The modern deformation regime was established 8–15 million years ago (Royden *et al.* 2008). The plate tectonic forces that formed the Tibetan Plateau occurred in stages, producing six nearly east–west oriented crustal blocks or terranes that are accreted to Eurasia. The Tibetan orogenic belt consists of (from south to north) the Himalayan, Lhasa, Qiangtang, Songpan-Ganzi-Hoh-Xil, Kunlun-Qaidam, and Qilian blocks, each of which is separated from one another by suture zones (Liu *et al.* 2019; Spicer *et al.* 2021). Upper Tibet is composed of the Himalayan block and two terranes, Lhasa and Qiangtang (each measuring more than 1000 km in length and 200–400 km in width), which are separated from one another by the Indus-Yarlung suture zone (consists of a depression with its two axial rivers flowing in opposite directions) and the Bangong-Nujiang suture zone (running north of the Ru thog, Sger rtse, Nyi ma and Nag chu county seats) respectively. The Qiangtang terrane was accreted to the Songpan-Ganzi terrane in the north along the Jinsha Suture during the late Triassic or early Jurassic, while the Lhasa terrane was accreted to the Qiangtang terrane along the Banggong Suture during the early Cretaceous (Dewey *et al.* 1988; Liu *et al.* 2015). The Qiangtang terrane is covered in Mesozoic strata with outcrops of granitoids and volcanic rocks, while the Bangong-Nujiang suture zone is composed of scattered ophiolitic fragments and Jurassic flysch, the remnants of

[9] For a general study of large mammals on the Byang thang, see Schaller 1998; 'Animal Diversity Web (ADW)': https://animaldiversity.org/. Selected wildlife of Upper Tibet will be examined in more detail in Vol. V of this study.

[10] For a list of bird species found on the Tibetan Plateau, see 'Avibase – The World Bird Database': https://avibase.bsc-eoc.org/checklist.jsp?region=cnti.

[11] Nevertheless, it is not yet known precisely when Cretaceous sedimentary formations associated with the orogenic cycles responsible for the Tethys Sea closure on the Byang thang formed. Dates range from the early to late Cretaceous. On questions related to the Tethys Sea closure, see Liu *et al.* 2018.

the Bangong-Nujiang Tethys (Liu *et al.* 2018). The Lhasa terrane, which underthrusts the Qiangtang block, is bounded on the south by the Gangdese (Transhimlayan) belt of magmatic rocks. South of that is the Himalayan orogenic belt. The Lhasa terrane is distinguished by the huge Early Jurassic-Middle Eocene Gangdese magmatic belt in the south and by Palaeozoic-Mesozoic strata in the centre and north (Liu *et al.* 2018). The Gangdese magmatic belt is thought to have formed during the north-dipping subduction of the Indus-Yarlung Tethyan lithosphere, or alternatively, after the collision of the Indian and Eurasian plates along the Indus-Yarlung suture (Liu *et al.* 2018). In tectonic terms, the Rtsa mda' basin (*c.* 10,000 km²) in Ngari is situated between the Himalayan orogenic belt and Lhasa terrane. The basement of the Rtsa' mda basin is composed of late Cenozoic limestone, sandstone and shallow metamorphic rocks upon which Neogene sediment was deposited (Huang *et al.* 2020). The water drainage system that developed in the basin had a strong erosive effect on the formation, creating an 'earth forest' (badlands) topography in which the entire *c.* 800 m thickness of the formation is exposed, an undisturbed sequence of fluvio-lacustrine deposits (Huang *et al.* 2020; Huntington 2014).[12]

Stod is part of a prefecture in the TAR called Ngari (Chinese: Ālǐ *Dìqū*). In premodern Tibet, this territory was known as the 'Three Divisions of Ngari' (Mnga' ris skor gsum).[13] What geographic entities constituted the three divisions (*skor ba*) varied over time and are not agreed upon in Tibetan historical literature, but originally embraced Spu rang, Gu ge, Sgar, Ru thog, Gro shod, Gung thang, and Mar yul (centred in Ladakh), etc.[14] The toponym Mnga' ris skor gsum is traceable to the 11th century AD, when these three regions were ruled by the sons of the first king of the Gu ge and Spu rang/Pu rang/Spu hreng kingdom, Nyi ma mgon: Dpal gyi mgon, Bkra shis mgon, and Lde gtsug mgon.[15] According to a local oral tradition, Ngari was once called Stod gling dgu (Bellezza 2001: 44), a toponym best historicised to the Imperial period. In the Tibetan literary tradition, Ngari is sometimes equated with Stod phyogs (Upper Regions), a geographic term whose use is first attested in the 9th century AD in the *Old Tibetan Chronicle* and *Old Tibetan Annals*. In a territorial, cultural, political, and linguistic sense it was also identified with the ancient toponymn and ethnonym 'Zhang zhung', which is first recorded in this form in Old Tibetan historical and mytho-ritual literature dating to the Imperial period (Bellezza 2018). It can be equated with the Chinese Yang t'ung of the Sui and T'ang annals.[16] As a cultural entity, Zhang zhung appears to have extended across the Byang thang as far east as the western margin of Dpal mgon County (Bellezza 2011). In the modern period, Ngari Prefecture (304,683 km²) is divided into seven counties, five of which overlap with Stod, as defined in this work: Ru thog, Sgar, Dge rgyas, Rtsa mda', and Spu rang.[17] In the first half of the second millennium AD, the territorial extent of Ngari was greater and key regions that are now part of Nepal and India were at turns dependencies of or heavily influenced by it. These regions on the western fringe of Tibetan Plateau include Mustang (Glo), Dolpo (Dol po), Humla ('Om lo), Limi (Sle mi), Spiti (Spyi ti), upper Kinnaur (Hang grang), and Ladakh (La dwags).

Stod on the average is situated at a lower elevation than the Byang thang. Whereas the Byang thang is distinguished by its thousands of lakes, Stod is characterized by several extensive valley systems poised between 3500–4500 m elevation. Where sufficient land and water is available these valley systems support agricultural enclaves in which barley and sometimes peas, mustard, and turnips are cultivated. Areas above 4500 m were occupied exclusively by herders (*'brog pa*) who reared yaks, sheep, goats, and horses, while agriculturists also raised hybrid yaks and donkeys. The most extensive valley system in Stod is in Gu ge, a highly dissected land of canyons and washes of *c.* 25,000 kms², which is sandwiched between the Transhimalaya and Great Himalaya ranges. Gu ge is partitioned into southern and northern halves by the Sutlej River (Glang chen gtsang po), which is fed by many dozens of perennial and intermittent streams. Major agricultural enclaves on the south side of the Sutlej River in Gu ge include (from north to south) include Za rang/Za hreng, Rtsa rang/Rtsa hreng, Mtho lding/Tho ling, Ma nam/Mang nang, Mda' ba/'Dar pa, Gdong po/Mdongs po, and Khyung lung.[18] The main agricultural areas on the north side of the Sutlej River in Gu ge are Chu gsum, Rab rgyas gling, Byang rtse/Shang rtse, and Dung dkar cum Phyi dbang, among others. The farmlands of Sgar County are irrigated by the Sgar gtsang po and its affluents, which flow into the Indus River (Sengge gtsang po) near the prefectural capital of Ngari (Chinese: Shiquanhe). The main foci of agrarian settlement in Sgar (from north

[12] The continuously deposited 800 m thick late Miocene to Pleistocene sediments of the Rtsa mda' (Zhada) Basin are one of the richest sources of pre-Ice Age vertebrate palaeontology on the Tibetan Plateau (Wang *et al.* 2013).

[13] For a rather poetic description of Mnga' ris taken from the Tibetan geographical work 'Dzam gling rgyas bshad, see Wylie 1962: 55–64.

[14] On this complex historical matter, see Vitali 1996: 153–161.

[15] On the formation of the kingdom of Gu ge and Spu rang, see Vitali 1996; Tucci 1956; Jackson 1976.

[16] On Yang t'ung in Chinese sources, see Bushell 1880.

[17] Although their areal characteristics were somewhat modified when they were annexed by the PRC, Sgar, Ru thog, and Spu rang designated ancient districts, the latter one possessing a name derived from the Zhang zhung language. Rtsa mda' (often transcribed into English as 'Zanda') corresponds with the old district of Gu ge, another name of Zhang zhung origins. The Gu ge region in the time of Zhang zhung is supposed to also have been called Kha yug (Bellezza 2011: 68). In premodern times, Dge rgyas was divided between Ru thog and the district of Gzhung pa ma tshan. On the premodern political and cultural geography of Gu ge and Ru thog, see Vitali 1999: 9–11.

[18] In Sti yag Township, which abuts the Indian border district of Kinnaur (Tibetan: Khu nu), there are a number of villages situated below 3500 m elevation that enjoy a more clement climate, where wheat, apples, apricots, and walnuts are grown.

to south) are Bde mchog, Bkra shis sgang, Gtso tsho, Sgar dgun sa, and Mtha' byang. The most important agricultural enclaves in Ru thog county (from north to south) are O byang, Chu lung, Ru thog proper, Rtsa phug/Rtswa phud, Bde rogs, Ri gsum, and Lcags sgang/Lcags khang. The lower portion of Spu rang County, in the southwest corner of Tibet, is watered by tributaries of the Karnali River and is home to some three dozen villages where the customary crops of Upper Tibet are cultivated.[19] There are three large lakes in far western Tibet. While none are associated with rock art sites, numerous archaic structural sites (residential and ceremonial) are found in their vicinity.[20] Mtsho mo ngang la ring mtsho (4240 m elevation), an endorheic lake in Ru thog, is 90 km long. Despite its great length, it is mostly 1 km to 2 km wide; however on its east side it attains 12 km in width. Mtsho mo ngang la ring mtsho is connected in the west by a narrow strait to Spang gong mtsho and they are often thought of as forming one very long lake. Spang gong mtsho straddles the poorly demarcated border between the PRC and India. On the southeast side of Mtsho mo ngang la ring mtsho there are several small islands including Dgon pa'i do, which hosts archaic all-stone corbelled residential ruins. They are misidentified in the oral tradition as being the remains of a Buddhist monastery (Bellezza 2014c: 359–361). In extreme southwest Tibet two highly celebrated lakes sit side by side and have come to be known internationally by their Sanskrit names, Manasarovar and Rakshastal. Located in Spu rang County, freshwater Manasarovar (410 km²; 4580 m elevation), which is called Mtsho ma pham/Mtsho ma pang in Tibetan, is a prime pilgrimage destination for Buddhists, Bonpo, Hindus, and Jains. Traces of two archaic hilltop installations (probable fortresses) are found on or near the lake; these are Ma pang spos mo mkhar and Byi'u mkhar (Bellezza 2014c: 40–43, 119–122). Rakshastal (260 km²; 4570 m elevation), or La lnga mtsho/La ngag mtsho in Tibetan, is a slightly brackish lake situated as little as 4 km west of Manasarovar. Two of its three islands, Do smug and Do ser, support the remains of archaic residential settlements containing all-stone corbelled structures (Bellezza 2014c: 483–490).

As compared to the Byang thang, the somewhat more amenable climate of Stod has ensured that it has remained a focus of intensive settlement for millennia. Once part of the Zhang zhung kingdom,[21] it was conquered by Central Tibet (Spu rgyal bod) in the mid-7th century AD and incorporated into the expanding Tibetan empire.[22] In the aftermath of the collapse of the empire, King Nyi ma mgon founded the Ngari (Gu ge-Spu rang) kingdom in the early 10th century CE. An invasion by Ladakh's King Sengge rnam rgyal in 1630 spelled its demise. The conquest of Ngari was initiated in 1679 by the Lhasa government headed by the Fifth Dalai Lama, Ngag dbang blo bzang rgya mtsho.[23] It is thought that in 1682 the Fifth Dalai Lama appointed the first district chiefs (*rdzong dpon*) of Ngari (Shastri 2003: 5).[24] The annexation of the region by the Lhasa government (Dga' ldan pho brang) ushered in a political and economic regime that changed little until the 1950s. The headquarters of the old government, Stod sgar, in the Sgar valley, was presided over by senior and junior governors (*sgar dpon*). Stod sgar had both summer and winter locations, higher elevation Sgar dbyar sa and Sgar dgun sa respectively.[25] The agricultural and pastoral lands of Ngari were tenanted by local residents who remitted produce to various government, aristocratic and monastic figures. Governance was controlled by representatives of the Dga' ldan pho brang, officials who held the rank of *rdzong dpon* (district leader), *spyi khyab* (district-level administrator), and *'go pa* (local chieftain), etc. Junior officials were usually natives of far western Tibet, some of whom belonged to prominent clans long settled in Ngari such as Khyung po, Gu rib, 'Bro, Snyags, and Cog ro. However, many senior officials hailed from Central Tibet. The most critical function of the authorities was the collection of taxes with a significant portion of the revenue retained by them personally. Taxes were paid in grain, butter, meat, salt, gold, and in currency, as well as in corvée labour and customs duties collected from international trade.[26] Due to the large distance between Ngari and Lhasa and inherent weaknesses in the institutional apparatus of the central and provincial governments, the administration of

[19] Scherrer (1906: 200) lists 37 villages by name and notes that only barley, peas and mustard are sown there.

[20] For the names and locations of these archaeological sites, see maps in Bellezza 2008: 702, 708, 718, 725; 2014a: 597, 606, 610, 617.

[21] The wide territorial compass of Zhang zhung in the pre-7th century AD setting, its possible political organization into a state or confederacy, areal links to the countries of Yang t'ung and Suvarṇagotra in Chinese and Indian literature respectively, and subsequent relegation in Tibetan sources to just the district of Gu ge were first investigated in depth by Tucci (1956: 71–105). Cultural, economic and political characteristics of Zhang zhung, broadly defined as designator of Upper Tibetan civilization in the Late Prehistoric era, are explored in Bellezza 2008; 2011; 2014d; 2020c. Also see approaches to Zhang zhung in Norbu 2009; Norbu and Pratts 1989; Snellgrove and Richardson 1968; Zeisler 2009-2010; Vitali 2008; Uray 1972; Aldenderfer 2007b; 2018. In Yungdrung Bon textual records, a number of Zhang zhung kings are recorded by name but they are not well historicized. See Bellezza 2008; 2011; Norbu and Pratts 1989.

[22] Borrowing from the work of Tibetologists such as Petech, Uray, Richardson, Beckwith, and Dotson, etc., the downfall of Zhang zhung is treated in Bellezza 2014b: 104–110.

[23] On the Ladakhi and Tibetan conquests of Ngari, see, e.g. Petech 1977; Nawang Jinpa 2015.

[24] There were four rdzong dpon in Ngari, who occupied forts in Ru thog proper, Rtsa pa rang, 'Dar pa, and Taklakot/Stag la mkhar (Wylie 1962: 120 (n. 59); Scherring 1906: 155). The ruins of these extensive hilltop strongholds are still visible and were constructed primarily of mud bricks and rammed earth. On the functions of the *rdzong dpon*, see Korpon Lobsang Khernrab 2000: 35.

[25] Tucci (1935: 144–148) describes these settlements and their dignitaries in some detail.

[26] On the collection of taxes, see Korpon Lobsang Khernrab 2000: 36–38. On corvée labour and the forced supply of provisions as well as corrupt business practices indulged in by government personnel, see Scherring 1906: 203–205; Korpon Lobsang Khernrab 2000: 35.

Ngari was not particularly efficient.[27] Unlike the Byang thang where much of the population resided in yak hair tents and pursued a semi-nomadic lifestyle, the farming villages of Ngari exhibited a highly evolved pattern of sedentary settlement. In the second millennium AD, the homes, irrigation systems and terraced fields of the agricultural villages were subsidiary elements of settlement in a network of Buddhist fortresses, palaces, monasteries, and temples that proliferated in the region.[28] The cultural wealth and intellectual sophistication of far western Tibet under Buddhism was every bit as great or exceeding that in other parts of Tibet, before precipitously declining over the last 400 years. No synopsis of the cultural attractions of Stod would be complete without mention of Mount Kailash (Tibetan: Gangs rin po che/Ti se; Sanskrit: Kailāsa), one of the most important pilgrimage places in Tibet.[29] Like its aqueous counterpart, Manasarovar, Mount Kailash has for centuries attracted Tibetan Buddhist, Bon, Hindu, and Jain pilgrims, who often carry out circumambulations.

Ib. Ancient Cultural Characteristics of Stod

This résumé of the ancient cultural characteristics of Stod serves as a prelude to more extensive treatment of the subject planned for Vol. V of the series. It is designed to equip the reader with an archaeological and historical orientation to the region, thereby placing the rock art inventoried in this volume in a broader context. Stod and the Byang thang share similar cultural, ecological, and topographical traits. The analogous rock art and monumental records demonstrate that their populations have been intimately tied together since no later than the Late Bronze Age.

It is still not known when the earliest homo sapiens colonizers reached the Tibetan Plateau. The most complete evidence for human settlement dating to the Stone Age in Upper Tibet comes from the Byang thang and appears to extend occupation to the Upper Palaeolithic some 20,000 to 40,000 years ago (see Vol. I: 5, Vol. II: 5, 6 of the series). Relatively little is also known about the Neolithic in Upper Tibet, a time before rock art production began in that territory.[30] The introduction to the Tibetan genome furnished in this work adds to that offered in Vols. I and II of the series. A recovery of limited ancient human remains in secure archaeological contexts have until recently impeded an understanding of the population history of the Tibetan Plateau.[31] A landmark study by Wang *et al.* (2023) pushes

[27] Scherring 1906: 145, 146) refers to the garphan (*sgar dpon*) as 'viceroy' and accuses them and their subordinate officers, the jongpens (*rdzong dpon*) and tarjums (*rta zam pa*, postal officer) of self-serving behavior and venality. According Vitali (1999: 56), Ngari was in terminal decline since the 18th or 19th century and its senior government administrators did not discharge their duties well. On the old government of Ngari, see also Swami Pranavānanda 1949: 75–77. Of higher moral authority traditionally in Ngari was the abbot (*mkhan po*) of the region's 'mother' monastery Mtho lding. His status and functions are described briefly by Scherring (1906: 153, 154). For more detailed coverage of Mtho lding, see Vitali 1999.

[28] A great deal has been written on elite architecture, art and the broader Buddhist infrastructure of Stod. For a global but substantially incomplete view see, e.g. Henss 2014. Vitali (1999: 151–154) lists around 80 Buddhist monasteries and temples in Ngari. An attempt has been made to map the locations of Tibetan monasteries with 2777 represented all over Tibetan cultural regions now part of the PRC. See Ling-Wei Kung: "Mapping Tibetan Monasteries: A Digital Humanities Project on Inner Asian Monasticism": mappingtibet.carto.com/viz/7e2d0148-8823-11e5-9753-0ea31932ec1d/public_map. Also see the tabulation of 567 monasteries in Central and Western Tibet in "The Tibetan & Himalayan Library": www.thlib.org/places/monasteries/list/tar/.

[29] On the cultural, religious, historical traits of this holy mountain, see Swami Pranavānanda 1949; McKay 2015; De Rossi Filibeck 1988; Snelling 1983.

[30] Aldenderfer (2007a) reviews archaeological evidence for Neolithic settlement in three major regions of the Tibetan Plateau: Amdo (Qinghai Plateau), Kham and Central Tibet. Neolithic sites in these three regions have been provisionally dated using chronometric means to a maximum of 6700, 5800, and 3800 years ago respectively. We estimate that *c.* 40 sites identified as Neolithic have been discovered on the Tibetan Plateau by Chinese archaeologists since the 1980s. On the Neolithic in Tibet, see also Chayet 1994: 34–55; Aldenderfer and Zhang 2004: 26–40; Aldenderfer 2011; d'Aploim Guedes and Aldenderfer 2020. Relying on Chinese publications, Aldenderfer and Zhang (2004: 27) list two Neolithic sites in Stod, Kyunglung (Khyung lung) and Dindun (Sdings zlum), as well as a microlithic site in Ru thog (Aldenderfer and Zhang 2004: 23, 24), but they provide no details about them (nor are these sites discussed in Aldenderfer 2007a; 2011). Several microlithic cores and blades from the Shar gtad mtshto site in the Re co valley (Ru thog), which are attributed to the Neolithic, are on display in the recently refurbished Tibet Museum (Lhasa). According to a preliminary report, a site occupying *c.* 100 m² on the north shore of Shar gtad mtsho was determined to have three discrete strata, the uppermost of which has yielded microliths (blades and cores), animal bones, charcoal, and two bone needles (Institute of Cultural Relics Protection of Tibetan Autonomous Region 2022). In 2018, a cave site called Me long brag phug, situated above the bank of Indus River in Dge rgyas County, was discovered by Chinese researchers. According to a preliminary report, microlithic cores and flakes, other stone tools made of obsidian flint and agate, and shards of redware and grayware were recovered from this site, which is believed to be at least 4000 years old (He *et al.* 2019).

[31] Lu *et al.* (2016a) conclude that the genetic origins of the Tibetans are considerably more ancient and more complex than previously thought, pushing them back to at least 40,000 years ago. The evidence presented in the Lu *et al.* study indicates the existence of both Palaeolithic and Neolithic ancestries in the Tibetan gene pool (paternal and maternal lineages), establishing genomic continuities between the prehistoric inhabitants and those of today. Based on the findings of various other studies as well as their own, Liu *et al.* (2022) conclude that the Tibetan genetic patrimony rests on a substratum of Palaeolithic Eurasian ancestry (making up as much as 20% of the Tibetan lineage), but most of their ancestry is held in common with Late Neolithic populations of the Upper Yellow River Basin, particularly those belonging to the Qijia culture. Nevertheless, Liu *et al.* (2022) hold that genetic links between Tibetans and lowlanders probably cannot be fully accounted for by wholesale migration emanating from the Upper Yellow River Basin, which served as a vehicle for the expansion of barley cultivation and domestic animals onto the Plateau, *c.* the early to middle second millennium BC. Based on major differences in the archaeological cultures of the Tibetan Plateau and Upper Yellow River Basin and the distribution of adaptive alleles related to hypoxia, Liu *et al.* (2022) consider that the Tibetan genetic pool potentially formed well before 2000 BC. In addition to examining the phylogenetic data of other East Asian populations, He *et al.* (2021) collected genome-wide data of 78 modern Tibetans that they differentiate into 11 geographic regions, as well as genomic data from eight genetically related ancient humans discovered in burials of the Mustang region of Nepal (in Chokhopani, Mebrak and Samdzong),

back the formation of a distinctive genetic identity on the Tibetan Plateau to *c.* 3100 BC, indicating that cultural and technological development in the territory from as early as the Late Neolithic was forged by peoples who shared much of their ancestry in common.[32] When viewed globally, archaeological evidence from Tibet demonstrates that this common genetic endowment extended to various societies and polities distributed over the Plateau in the Late Prehistoric era, each with its own sets of monuments, artifacts and rock art, as well as distinctive economic and political regimes. Parallels in rock art output in Upper Tibet and adjoining areas on the Western Tibetan Plateau, Central Tibet, northern Kham, and Amdo, when seen against the unique Tibetan genetic patrimony, permit us to more confidently posit the existence of a bundle of interrelated cultural orders across much of the Plateau in the Late Prehistoric era, which in concert gave birth to a discrete Tibetic civilization. Wang *et al.* (2023) confirm that the various areas of Upper Tibet were subject to increasing genetic homogenization during the Late Prehistoric era and Early Historic period, reflecting more broadly that the most powerful demographic dynamic shaping Tibetan population history was the intermingling of various Plateau populations. As almost all contemporary Tibetans and Sherpas exhibit southern plateau ancestry, Wang *et al.* (2023) hold that the Gtsang po River valley was a major conduit for prehistoric migration on the Tibetan Plateau. However, their concept of a river conduit requires some revision. There are seven or eight major gorges along the Gtsang po River between Upper Tibet and Lhokha, which forced transportation arteries out of the valley and over passes, entailing large detours. This was the state of affairs until the Modern period. The majority of agrarian settlement in Upper and Central Tibet is concentrated in tributary valleys, not in the main Gtsang po valley, and they are often interconnected along alternative routes. Thus, it is probably better to speak in terms of multiple conduits interlacing the southern tier of Upper Tibet and Central Tibet along which gene flows occurred. Routes across the southern tier of the Byang thang, a belt of interconnected lake basins, should also be considered in plotting ancient population movements. Tentatively, the higher level of genetic differentiation observed in Plateau populations prior to 500 BC can be related to tribal, cultural and linguistic divisions documented in Tibetan historical and clan literature. The southeast-central genomic cluster of Wang *et al.* (2023) is centered in the area associated

which date between *c.* 800 BC – AD 500. The He *et al.* (2021) study holds that modern Tibetans can be divided into several population substructures: Central Tibetans have predominant Paleolithic and Neolithic ancestries derived from indigenous hunting-foraging groups that stem from remote Eurasian lineages and the upper Yellow River Basin respectively, and Amdo Tibetans on the northeast part of the Plateau have an admixture of 2% or 3% western Eurasian haplotypes; while Kham Tibetans in the southeast have strong Neolithic Southeast Asian affinities. Presumably, for the purposes of their study, He *et al.* (2021) subsume adjoining parts of Upper Tibet under Central Tibet, but nowhere is this made manifest. Another study of genome-wide SNP data by Ma *et al.* (2022) suggests that the general pattern of allele and haplotype sharing between Tibetans living in eastern Nagchu (Sbra chen County), Lhasa, Shigatse, and Chamdo is characterized by a significant degree of genetic homogeny. Thus this study refers to these overlapping groups or clades as 'core Tibetans'. The Ma *et al.* (2022) study reaffirms that the so-called core Tibetans share much of their genetic ancestry with the prehistoric populations in Mustang noted above. The scope of genetic drift and admixture and its implications for an understanding of Tibetan population history discussed in the studies outlined in this footnote are still to be reckoned with fully.

[32] The need to sample larger quantities of ancient nuclear and mitochondrial DNA to more accurately fix historical and spatial relationships between the prehistoric and contemporary populations of Tibet has been partly met by a new study conducted by Wang *et al.* (2023). An analysis of the genomes of 75 unrelated individuals from 29 sites across the Tibetan Plateau, which are mostly dated through radiocarbon assaying (62 individuals), but also utilizing archaeological data, to 5100–100 years ago, reveal a unique genetic ancestry for the territory. 21 of these individuals were dated to 5100 to 3900 years before present. Additionally, genomic data from 33 individuals in Mustang was subject to genetic history analysis by Wang *et al.* (2023). Their study confirms that contemporary populations of the Tibetan Plateau and Himalayan rimland, Tibetan, Qiang and Sherpa, share strong genetic links to individuals who lived on the Plateau 5100–300 years ago. The work demonstrates that ancient populations on the Plateau and Himalayan rimland were closely related to northern East Asians that inhabited the upper Yellow River valley, Inner Mongolia and the Amur River valley, and to a lesser degree to a still unsampled 'ghost population'. What are termed 'Early Ancient Tibetans' inhabited all areas of the Tibetan Plateau 5100–2500 years ago. They share much (at least 74%) allele overlap with one or more northern East Asian populations of the Neolithic that that lived 9500–4000 years ago. This appears to have come about through human population movements and expansion in northern East Asia. The remaining 7% – 26% genetic overlap is attributed to more deeply diverged Asian ancestries, which may be related to Paleolithic populations on the Tibetan Plateau having one or more of the following origins: 45,000-year-old individual from Ust'-Ishim Siberia; 40,000-year-old individual from Tianyuan, northern China; present-day Andamanese islanders. Pronounced differentiation permits Early Ancient Tibetans to be divided into at least three genetic clusters indicating that distinct ancestral patterns had developed before 2500 years ago: northeast cluster (composed of individuals 5100–2800 years old from Yushu prefecture and Zongri in the Gonghe Basin); southeast-central cluster (composed of individuals 2800–2500 years old from the Chamdo and Nagchu Prefectures); and south-southwest cluster (composed of individuals 3400–2600 years old from the Lhokha and Shigatse Prefectures). The oldest individuals tested from Ngari Prefecture came from a cemetery in Phyi dbang (*c.* 300 BC) and form a phylogenetic clade with individuals from the south-southwest cluster. The genetic ancestry of the south-southwest cluster can be traced back to 3400 years ago and remained stable over a wide section of territory that extended from Gu ge east to Lho kha until 1900 years ago. Admixture with other Plateau populations occurred subsequently. What Wang *et al.* (2023) call the southeast-central cluster included populations in Nagchu and Chamdo prefectures prior to 500 BC. However, after 400 AD individuals from Nagchu are subject to patterns of genetic drift associated with those from the south-southwest cluster and they come to share the same ancestry. A study by Bai *et al.* (2024) more comprehensively explores genetic continuities and interactions between western Tibetan populations extending back to 1500 BC. This study is based on newly sequenced genome-wide SNP data from 65 individuals recovered from seven sites in Gu ge and Spu rang Counties, 17 of which yielded calibrated radiocarbon dates of *c.* 3,500–300 years before present (1950 AD). The findings of Bai *et al.* (2024) confirm that western Tibetans share the majority of their genetic heritage with other populations on the Tibetan Plateau, with genetic drift most strongly encompassing Central Tibet populations by *c.* 3000 years ago, but with increased Central Tibetan genetic components being detected in western Tibetan individuals from Spu rang (1800 years before present) and Mkhar gdong (1600 years before present). See, as above, Bai *et al.* 2024.

with the ancient polity and ethnos known as Sum pa,[33] while Zhang Zhung and Bod geographically correspond with the south-southwest cluster. Nonetheless more archaeogenetic data based on DNA sampling of a much greater cross-section of the ancient populations of Upper Tibet is required to more clearly understand the evolving demographic composition of the region and how these accord with its socioeconomic and political posture.[34] It also remains to be determined whether genetically distinguishable cohorts contributed to social stratification in Upper Tibet, as manifested in its diverse residential and burial monuments. Questions revolving around the complexity of the polities (confederation, proto-state, state) that took root in the Late Prehistoric era may also be better clarified by investigating the interplay between migration and indigeneity in ancient demographic patterns visible in Upper Tibet.[35]

The cultural and linguistic relationships between their Neolithic predecessors and the creators of early rock art in Upper Tibet remain shrouded in mystery. It is very likely though that some sites in which rock art occurs were exploited by antecedent Neolithic hunting and foraging peoples (vestiges of permanent dwellings or other fixed structures dating to this time have not been identified). At any rate, that Upper Tibetans in the Late Bronze Age and Iron Age chiefly arose endogenously from Neolithic hunting, foraging, agrarian and/or pastoral societies is supported by genomic findings, indicating that there was no fundamental demographic break in Tibetan populations after the Late Neolithic (*c.* 3000 BC).[36] Wang *et al.* (2023) verify that the Central Tibetans are closely related genetically to the inhabitants of Chokhopani (*c.* 800–600 BC), Mustang.[37] An extensive study of ancient genomes from Transhimalayan regions of Nepal furnishes data for the existence of a Tibetan gene pool *c.* 1500–1300 BC, at least 500 years earlier than findings from Chokhopani (Liu *et al.* 2022). This study is based on genome-wide data obtained through DNA extracted from dental materials belonging to 38 individuals in seven burial sites in the Mustang and Manang regions of Nepal, which range in age from *c.* 1500 BC – AD 650.[38] These findings and those of Wang *et al.* 2023 and Bai *et al.* 2024 indicate that

[33] For a recent investigation of the territorial characteristics of Sum pa, see Sokhina 2021.

[34] Wang *et al.* (2023) suggest that Zhang zhung seen as a state-level society may help to explain why a 1600-year-old individual from Nagchu is most intimately allied genetically to a 1900-year-old individual from Sding chung (site along the upper reaches of the Gtsang po river valley in 'Brong pa County) despite the geographic distances involved. On the other hand, individuals from the Nagchu Prefecture dated to 600–900 AD have a tighter genetic relationship with 2200- or to 2100-year-old individuals from Lhokha Prefecture, a nucleus of the Tibetan empire, suggesting that it too left a genetic imprint on Nagchu Prefecture. According to Wang *et al.* (2023), increased population interactivity and diversity in Nagchu from 500 BC to AD 900 is likely to be related to migration and amplified demographic connectivity facilitated by the emergence of Zhang zhung followed by the Tibetan empire.

[35] A study by Lee *et al.* (2023) may prove instructive in untangling the ancient population structure of Upper Tibetan: it begins to address the nature of genetic heterogeneity in the Xiongnu empire by qualifying demographic relationships between local communities and the empire-wide polity.

[36] It appears that it was the native inhabitants of Upper Tibet who incorporated bronze technologies from North Inner Asian sources into their cultural matrix in the Late Bronze Age and Iron Age (Bellezza 2020a; March 2016 *Flight of the Khyung*: www.tibetarchaeology.com/march-2016/). This indigenous adaptation of Eurasian technological advances coincided with other innovations that led to more socially and economically complex societies in Late Bronze Age and Iron Age Upper Tibet (Bellezza 2020c). Cao *et al.* (2022) observe that the repertory of copper and arsenical copper tools and ornaments from burials of Gepa Serul (*c.* 1600–1100 BC), in far western Tibet, have strong affinities with those of bronze cultures of the Eastern Steppe and Northern Zone (Northwest China). Lead isotope values of most objects from Gepa Serul are characterized as highly radiogenic lead (HRL) but differ markedly from HRL ores used in the Central Plains, Hexi Corridor and Xinjiang; therefore direct transmission of metallurgical technologies and objects to far western Tibet is not likely (Cao *et al.* 2022). Also, a lack of correlation in lead isotope values obtained from copper alloy objects recovered from burials in Phyi dbang and Dung dkar dated to *c.* 400 BC to AD 600 with objects from mainland China may possibly suggest that local ores were used to manufacture them (Li *et al.* 2022). That Tibetan copper alloy objects of the Late Prehistoric era are derivative and not simply copies of those belonging to the Northern Zone and Xinjiang is supported by the typological study of a wide range of metallic objects (Bellezza 2020a; 2020c). Yet, this does not rule out foreign groups through invasion, migration or bride sharing as having contributed to the cultural florescence of Upper Tibet in the Late Prehistoric era. Any such interactions may possibly have involved introgression or perhaps the mixing of novel haplotypes into the Upper Tibetan gene pool. The welter of clans and tribes, some of foreign origins, stated in Tibetan literature to have settled in Upper Tibet does suggest a process of demic augmentation in the region over the long haul. The timescale of this process, however, is unclear in the texts.

[37] There are also strong genetic affinities between modern-day Tibetans and Sherpa and members of the Bsam rdzong (Samdzong) culture in Mustang (*c.* AD 400–700). See Aldenderfer and Eng 2016.

[38] Genetic profiles were obtained from (Suila (1494–1317 BC), Lubrak (1269–1123 BC), Rhirhi (805–767 BC), Kyang (695–206 BC), Chokhopani (801–770 BC), Mebrak (500 BC – AD 1), and Samdzong (AD 450–650), all of which have been shown to be closely related to contemporary Tibetans and Sherpas. Genetic differentiation from lowland populations and the formation of the Tibetan gene pool is traceable through dental materials from Suila and Lubrak to *c.* 1500–1300 BC. A Tibetan genetic cline extending from north-eastern Tibet to the Himalaya has been identified, which is theorized to be the result of population and linguistic dispersal originating in the north-eastern fringes of the Plateau. See, as above, Liu *et al.* 2022. Nevertheless genomic analysis carried out by Bai *et al.* (2024) indicates that the earliest sequenced population in western Tibet (Gepa Serul, *c.* 3500 years ago) was more related to ancient Central Tibetans than to populations in Mustang. There is still no broad consensus among historical linguists regarding the timeline of the Bodish language subclade (from which Tibetic languages were derived). Based on a phylogenetic reconstruction of Sino-Tibetan languages relying on Bayesian computational methods, one preliminary study holds that Bodish languages first appeared on the northeast part of the Tibetan Plateau *c.* 5000 years ago before spreading across the Plateau some 3600 years ago, along with barley cultivation and the rearing of sheep (Zhang *et al.* 2019). Similarly, another preliminary study using linguistic-phylogenetic methods proposes that the non-Sinitic branch of Sino-Tibetan that they call Tibeto-Dulang originated on the western loess plateau before disseminating west and south on the Tibetan Plateau, but it also considers the possibility that Western Himalayish languages migrated west separately (Sagart *et al.* 2019). Sagart *et al.* 2019 endorse the proposition that "...language families arise through demographic processes driven by favorable changes in food procurement", an idea that is highly speculative. It must be noted however that the existence of a Sino-Tibetan family of languages is increasingly being called into question. For instance, due to a lack of phylogenetic evidence based on historical phonology and grammar, van Driem (2023) advances a 'Trans-Himalayan' model to account for the origins and spread of Bodic languages.

the demographic composition of Tibetans has been relatively stable since the Late Neolithic/Bronze Age. Hence it appears that the rock art corpus of Upper Tibet was primarily the production of individuals possessing a Tibetan genetic profile. It follows that the thematic, artistic and technical developments in the rock art of the territory can mostly be assigned to internal cultural processes rather than to extraneous factors such as major demographic shifts in the population. That historic Tibetans are largely of the same ancestry as their forebears of the Late Prehistoric era goes some way in explaining the manifold continuities exhibited in the content of rock art, not just in Upper Tibet but across much of the Plateau (this topic will be discussed in Vol. V of the series).

The inhabitants of Stod have long depended on agriculture but also on stock rearing (cattle, yaks, sheep, goats, horses) for their subsistence.[39] In addition to pastoralism and agriculture, hunting has played a relatively small but significant role in the local economy. Some of the earliest evidence for pastoralism and the consumption of dairy products in Tibet comes from Gu ge, a foundational economic activity that was established by 1500–1300 BC (Tang *et al.* 2023).[40] Although the sample size of the Tang *et al.* (2023) study is relatively small, it furnishes the best indication yet of the key role that pastoralism has played in the Upper Tibetan economy since the Late Neolithic/Bronze Age. This suggests that at least some of even the earliest rock art in Stod was produced by those pursuing a pastoral or agropastoral way of life. Tang *et al.* (2023) write, 'vast non-arable regions of the plateau likely remained challenging for long-term and year-round occupation until the adoption of mobile pastoralism.' Hence the study assumes that pastoralism was instrumental in allowing Tibetans to expand into non-arable regions of the Plateau, but many of these higher areas are likely to have been occupied earlier by hunters and foragers, even though population densities must have been considerably lower. The virtual absence of livestock herding in the rock art repertory of Upper Tibet emphasizes that pastoralism was hardly viewed as fit for illustration by rock carvers and painters. Rather, it was hunting and its ritual and ideological underpinnings that captured much of the imagination of rock art makers in Stod. The earliest evidence for agriculture in Stod dates to the Protohistoric period, but this state of affairs is probably related to the limited datasets currently available. A number of plant and animal species were identified in the fortified hilltop settlement of Mkhar gdong, Gu ge, including a barleycorn and barley rachises, free-threshing wheat caryopses (*T. aestivum/turgidum*) etc.; archaeo-botanical data from the site has yielded calibrated radiocarbon dates of AD 220–335 and AD 694–880 (d'Alpoim Guedes *et al.* 2014).[41] d'Alpoim Guedes

[39] For a review of what is known regarding the origins and development of animal domestication and stockbreeding in Tibet, see d'Alpoim Guedes and Aldenderfer 2020. More recently, Chen *et al.* (2023) carried out genetic and zoo-archaeological analyses of bovine remains from the site of Bangga, in the Yar lung gtsang po Valley of Central Tibet, furnishing evidence for the rearing of domestic yaks and yak-cattle hybrids, *c.* 2500 years ago.

[40] Paleoproteomic evidence was gathered through an analysis of proteins in the dental calculus of 40 ancient Tibetans from 15 different sites spread out on the Plateau by Tang *et al.* (2023). This work indicates that the use of dairy products and pastoralism in Tibet began by *c.* 3500 years ago. As the authors assert, the adoption of pastoralism and the use of nutrient-laden milk products helped make larger-scale permanent habitation into the non-arable highlands of the Plateau possible, an area that constitutes most of the Plateau (68% of it is now given over to pastoralism, which supplies a major source of calories in the Tibetan diet). Dairy proteins derived from goats and sheep and possibly from yaks and yak hybrids were detected in the calcified matrix of dental calculus recovered from 24 samples at six sites in Gu ge (far western Tibet), dating from *c.* 1500 BC to 550 AD. From six of 15 individuals in four of the sites in Gu ge well preserved peptides in whey protein were detected and are consistent with widespread milk consumption by both sexes. BLG peptides specific to goats from a Gu ge site the authors call Gepaseru (Gepa Serul/Gebusailu) that was dated to *c.* 1500–1300 BC furnishes the earliest evidence thus far for dairy consumption on the Tibetan Plateau. However, the absence of dairy proteins in the dental calculus of some individuals in Gu ge suggests that milk consumption may not have been universal. Also, due to a lack of the correct protein signatures in the dental calculus of individuals from arable sites on the Plateau, the authors tentatively conclude that the consumption of dairy products may have been less vital in farming regions than in the non-arable highlands. Tang *et al.* (2023) caution that further proteomic analysis along with zoo-archaeological, lipids preserved in ceramics, and paleo-ecological research is required to better understand the origins and spread of pastoralism in Tibet.

[41] d'Alpoim Guedes *et al.* (2014) show that a suite of crops introduced into Tibet by *c.* 1400 BC included bread wheat (Triticum aestivum), naked or hulless barley (Hordeum vulgare var. nudum) and peas (Pisum sativum). According to the authors, evidence for a wide range of western domesticates first appears in Central Tibet at Tranggo ('Phrang sgo), in the Yarlung Tsangpo valley (Gong dkar County). It appears that in the late second millennium BCE or early first millennium BCE, a free-threshing variety of wheat, naked barley, pea, rye (Secale sp.), and naked oat (Avena nuda) were known in Tranggo, either as trade items or cultivated crops. The authors caution though that this list of domesticated plant species is somewhat tenuous due to the sample collection methods used by Chinese archaeologists involved in the study of the site. d'Alpoim Guedes *et al.* (2014) observe that the eventual adoption of Middle Eastern plant domesticates in Tibet was encouraged by the frost resistance of barley and wheat, something not shared by an earlier suite of domesticates based upon millets. As is well established, the short growing season for barley (60–100 days) and its robustness in the face of low temperatures and persistent frost make it ideally suited for cultivation on the Tibetan Plateau. Recent genetic evidence summarized by the authors indicates that the naked barley and six-row barley (Hordeum vulgare L.) grown in Tibet have a monophyletic origin, pointing to Southwest Asia as the ultimate source for their domestication. D'Alpoim Guedes *et al.* (2014) note that, as in northern Europe, before wheat and barley could be grown in Tibet, phenotypes that permitted sowing in Spring had to be developed first. The authors consider that gene flow between indigenous wild barley and the introduced domesticates possibly occurred, creating local barley cultivars that were especially well adapted to the environmental conditions of the Plateau. On the origins of agriculture in Tibet, see also d'Alpoim Guedes *et al.* (2016); d'Alpoim Guedes (2015); d'Alpoim Guedes and Aldenderfer 2020; Chen *et al.* (2015). It must be noted though that claims made in Chen *et al.* (2015) that an agropastoral way of life introduced after *c.* 1700 BC was responsible for the permanent habitation of much of the Tibetan Plateau cannot be sustained in light of more recent archaeological and archaeogenetic studies. Chen *et al.* (2015) maintain that the sustained occupation of the Tibetan Plateau was facilitated by the cultivation of wheat and especially barley. This, they say, replaced seasonal forays by hunter-gathers as the prime mode of human occupation in the

et al. (2014) believe that the relatively large amounts of goat and sheep dung found at Mkhar gdong probably point to the penning of the animals, thus pastoralism. The authors hold that the occurrence of animal dung along with barley and buckwheat rachises and chaff bespeaks an economy based on a mixed agropastoral system of considerable complexity, which developed by the second or third century AD.[42] Moreover, the bones of small fish from the site suggest that fishing took place locally (d'Alpoim Guedes *et al.* 2014). Evidence for fishing found at Mkhar gdong dovetails with an account in the *Old Tibetan Chronicle* about Sad mar kar, a Tibetan princess (*btsan mo*) who married the Zhang Zhung ruler, Lǐg myi rhya, in the 630s AD. Sad mar kar went on a fishing trip to Lake Manasarovar (Mtsho ma pang), but she complained bitterly about the fish diet served in the castle of Khyung lung rngul mkhar, a site best identified with Mkhar gdong.[43] Foraging activities in the botanical assemblage at Mkhar gdong seem to be reflected in a pine nut shell, wild raspberry seeds and possibly Potentilla seeds (d'Alpoim Guedes *et al.* 2014). The late period of occupation at Mkhar gdong (694–880 AD) squarely coincides with the Imperial period, suggesting that Mkhar gdong had become a garrison for troops and/or an administrative centre of the Tibetan emperors (*btsan po*). Forward lines of command and control were necessary for the invasion and conquest of Ladakh, northern Pakistan and Wakhan in the 8th century CE, and we might see the Mkhar gdong of this period as fitting into that strategic calculus.

Despite the limited archaeobotanical evidence for ancient agriculture in Stod now available to us, it is clear through field observations that the region was much more extensively cultivated in the past. Remnants of past agriculture in the form of terraces, masonry retaining and partitioning walls, irrigation systems, and fields that contrast in colour, morphology and soil composition with adjoining terrain, characterize disused arable lands in Stod and on the Byang thang. The geographic breadth of this evidence suggests that settlement patterns have been altered significantly in Stod, which probably had a large impact on population densities in various locales, if not regionally too. The cultivation of barley and other crops was predicated on significant investments of labour and technological know-how, which were probably tied to the spread of sedentary forms of settlement and, at least in some cases, to the establishment of villages with permanent forms of shelter (cf. Bellezza 2008: 151). It is still not known when agricultural production in the region was at its peak, nor is it clear how steep the decline in production was in successive centuries. Operating under the premise that climatic and environmental conditions in Stod have generally declined in the Late Holocene, we suggest that agricultural there was at its most productive sometime during the Late Prehistoric era. The main factor accounting for a sharp reduction of tilled holdings appears to be regional desiccation and the consequent diminution of local water resources (cf. Bellezza 2008: 149).[44] This is substantiated by the author's multiyear reconnaissance missions, which have detected the disappearance of many perennial streams that once fed agricultural lands. Further support comes from local oral traditions, which associate the amplified scope for the cultivation of crops in ancient times with the Mon/Skal mon (Bellezza 2008: 152). This shadowy ancient tribe is believed to have dominated Stod in the period before Buddhism took root there, but their outsized role is largely apocryphal. While climatic cycles associated with less rainfall are likely to have played a role, the cumulative shrinkage of glaciers feeding watercourses used for irrigation, despite various glacial advances over the last 3000 years, appears to be the most crucial factor.[45] However, the climatic dynamics associated with changes in glacial mass are very complex and still poorly understood. There were periods of neoglaciation in Tibet 3600–2400 years ago and in the Little Ice Age (Owen 2008), as well as other advances during the first half of the first millennium AD (Solomina *et al.* 2016; Yi *et al.* 2008). It is estimated that Tibetan glaciers in Himalayan regions have lost *c.* 40% of their mass since the Little Ice Age (Lee *et al.* 2021). By no means did the

territory. Despite suggestions to the contrary by the authors, there is no definitive evidence indicating that foragers migrated on a seasonal basis to high elevation Paleolithic and Neolithic sites in northeast Tibet, let alone to interior portions of the vast Tibetan Plateau. Chen *et al.* (2015) write, 'The NETP constitutes an altitudinal entry point into the higher plateau from the adjacent Loess Plateau, with which it shares a series of Neolithic and Bronze Age material cultures.' The cultures mentioned and dates given for them include late Yangshao (3500–3000 BC), Majiayao (3300–2000 BC), Qijia (2100–1600 BC), Xindian (1400–700 BC), Kayue (1600–600 BC), and Nuomuhong (1400–800 BC). This assumption about the interrelatedness of archaeological cultures on the Tibetan Plateau and Loess Plateau however does not take into consideration significant regional variability exhibited by the archaeological record, adaptive human ecological processes in different environments, and cultural affinities with more distant Neolithic cultures of the Tibetan Plateau such as Mkhar ro (Kham) and Chu gong (Lhasa).

[42] Tang *et al.* (2021) believe that there was a dominant barley economy at Mkhar gdong during a later phase of occupation (455–700 AD). Approximately 100 barley grains were recovered from a stone structure at Dindun (Sdings zlum), in Gu ge, and dated to *c.* 350 BC to AD 70. The rachises found at these two sites indicate that barley was locally grown; however, the role of barley in the local diet is still obscure. See, as above, Tang *et al.* 2021: 7. Although little evidence elucidating grain consumption in Stod in the time-frame noted above has been forthcoming, barley is likely to have been a dietary stable, as it is very well adapted to local the environmental conditions.

[43] On the identification of Mkhar gdong with the castle of Khyung lung dngul mkhar (*sic*) of literary sources, see Bellezza 2002: 37–39. This identification is increasingly accepted by researchers. Spread out below Mkhar gdong are farm fields, many of which now lie fallow.

[44] Dozens of interviews were conducted with farmers in Stod by the author between 1999 and 2011. Overwhelmingly, the shrinkage of land still suitable for cultivation is attributed to diminishing water supplies. Moreover, there is widespread recognition that this is both a present-day challenge and a chronic problem that was long in the making.

[45] Anthropogenic factors are also likely to have played a significant role in the desertion of a way of life based on the working of the soil. For preliminary thoughts on this subject, see Bellezza 2008: 150.

Figure Ib.1. Some of the utterly abandoned farmlands near Ru se mkhar, Gu ge.

Figure Ib.2. The defunct agricultural village of Dar sgam mkhar, Gu ge.

abandonment of agriculture transpire solely in the Late Prehistoric epoch and Early Historic period; many Buddhist sites of the Vestigial period are now associated with reduced cultivatable lands, suggesting that the process of agricultural diminution in Stod was a long and relatively gradual one (Bellezza 2008: 155). The shift to a colder climate *c.* 1000 years ago (Saha *et al.* 2019) is likely to have exerted more stress on agricultural production in Stod.[46] Nonetheless differences in geographic settings and the hydrological resources available in arable sites suggests that potentially the loss of agricultural occurred at variable rates (Bellezza 2008: 150). We estimate farming in each of the still viable agrarian enclaves in Ru thog, Sgar and Gu ge specified in Section Ia has been reduced in area by between 20% and 90%.[47] Moreover, there are many other defunct arable lands in these three erstwhile districts, perhaps increasing the extent of agriculture once practiced in all of Stod by a factor of ten. That much arable land has been forsaken in Gu ge was noted by Scherrer (1906: 336, 337), who wrote, '...much cultivation has been abandoned or allowed to

[46] Based on an analysis of elemental composition and oxygen isotope ratios from sediments obtained in Lake Jiang located west of Nag chu City, Hou *et al.* 2023 tentatively identify a warmer and moister period in Central Tibet lasting from *c.* AD 600–800, which they believe contributed to the rise and expansion of the Tibetan empire by increasing barley production by a hypothetical 25%. Hou *et al.* 2023 inexplicably identify an extensive area of barley cultivation in the Eastern Byang thang around Dpal mgon County, which never existed at that scale. Although proxy data for paleoclimate reconstruction in Central Tibet cannot be extrapolated to Ngari due to varying environmental and climatic conditions, the prospect that more barley was cultivated in Stod during the Imperial period than at present must be considered.

[47] A remote survey of the Bral gdong po valley in Gu ge determined that only 38% of the 216.7 mu (1 mu = .067 of a hectare) of the arable land in the vicinity of village is still under cultivation (Ryavec 2005). For the findings of a reconnaissance of the Bral gdong po valley and extensive abandoned farmlands in subsidiary valleys, see Bellezza 2014c: 259, 260.

Figure Ib.3. A few of the long-deserted fields in the lower She rang valley, Ru thog.

remain fallow, and there are villages full of dwellings which are lying uninhabited.' At any rate, a timeline for the expansion and contraction of farming in Ngari will remain obscure until dedicated remote sensing, as well as on-site edaphological and geomorphological surveys in conjunction with the absolute dating of soils and organic materials, can be conducted.

In addition to areas where farming is still practiced noted above (although less intensively than in the past), there are many dozens of agricultural enclaves in Stod that have been abandoned or nearly so (Figures Ib.1–3).[48] A small cross-section of these former farming communities is given here to help illustrate the heightened role that agriculture in Stod enjoyed in the past. Agriculture was once carried out in various tributary valleys of Ra bang and Khul pa/Gul pa in Ru thog but very little cultivation takes place there at present. Especially well-developed agricultural centres in Khul pa included 'Tshe lung/Mtshe lung, where two fortresses attributed to the ancient Mon tribe were constructed (Bellezza 2002: 30–32), as well as Dung dkar and Bla nyung (Bellezza 2014: 91). The largest forgotten agrarian site reconnoitred in Ru thog extends from the ancient hilltop stronghold of She rang mkhar gog to the abandoned village of Yul lung (Bellezza 2014c: 134–136, 382–385), one of several tributary valleys of the Ma ga gtsang po (Ri gsum Township) that were once cultivated. Two large, utterly abandoned large farming settlements in Ru thog with highly developed archaic residential structures are Sa rā (situated on the north side of Lake Mtsho mo ngang la ring mtsho; Bellezza 2014c: 432–437) and Ge khod mkhar lung (at the foot of Ru thog's best known sacred mountain, Ge khod; Bellezza 2014c: 138–144). Many other examples could be given. That Ru thog was once more thickly populated is acknowledged in the oral tradition (Bellezza 2002: 31 (n. 27)). In Sgar, ancient agricultural structures and fields occur below the archaic hilltop redoubts of Mchong gog mon mkhar, A gog mkhar, Ko logs mkhar, Gser gzhung mkhar gog, and Zhing mkhar mkhar gog (Bellezza 2008: 152 (n. 161)), and at Mkhar lung, and Ma lhas (Bellezza 2014c: 81, 82), etc. The deeply dissected valleys of Gu ge harbour the largest aggregation of defunct agricultural lands in Upper Tibet. There is some evidence to suggest that every agricultural village in Guge was accompanied by an elite residential complex perched on a nearby summit in the Late Prehistoric era (Bellezza 2020c: 299). For example, three archaic strongholds

[48] On the locations and descriptions of defunct agricultural areas in Stod, see Bellezza 2002; 2008; 2014a; 2014b; 2014c. The most detailed treatment of the subject by the author is Bellezza 2008: 149–156.

overlooking once ample farmlands on the south side of the Sutlej river are Ru la mkhar (Bellezza 2014c: 271–275), Ru se mkhar[49] and Dar sgam mkhar.[50] Near the famous Buddhist monastery of Rtsa pa rang there is a string of five derelict agricultural settlements with the remains of Buddhist temples extending for 15 km along the north bank of the Sutlej River: Ka ru, Gi ri, Sgo gyam, Ser sgam, and Mang brag (Bellezza 2014c: 70, 71). In the Rong chung region of Gu ge the impressive citadel of Ma ṇi thang mkhar presides over now forlorn agricultural fields (Bellezza 2014c: 218–221). In southeast Gu ge (Gu ge lho stod) large agricultural holdings that, despite plentiful water reserves, are now mostly disused occur near Spang bkra dkar rdzong (Bellezza 2014c: 237–239). As water is seemingly not a problem, the underusage of arable lands in Spang bkra dkar rdzong in the Modern period (once the site of a large troglodytic community) is, at least in part, assignable to anthropogenic factors. Not far from Spang bkra dkar rdzong, deserted fields extending for *c.* 2 km sit on a shelf beside Rgyu mgul mkhar, large residential structures perched on rock pinnacles (Bellezza 2014c: 64–67).

The increased productive capacity made possible by agriculture contributed to the founding of elite residential facilities in Stod such as temples and castles of the Late Prehistoric era and Early Historic period (Bellezza 2008: 32, 54). It appears that surpluses generated through agriculture as well as pastoralism and trade facilitated the rise of an Upper Tibetan elite that sought to safeguard political and economic gains by building and taking up residence in large and defended installations (Bellezza 2020c: 298, 299). Agriculture and stock-rearing were widely disseminated in Stod and had the potential to produce surpluses that could be collected and stored by sections of society of higher rank and status. An expansion of livestock herding, mining, and trading activities would have been the most effective economic means for ancient Upper Tibetans to counteract chronic loss of agricultural productivity once it had set in (Bellezza 2020c: 300). The export of valuable native commodities such as gold, musk, minerals, and animal products potentially not only compensated for any food production losses but could have multiplied the prosperity of territory. North Inner Asian and Himalayan regions were best positioned as trading partners and intermediaries, each with its own complement of goods and commodities attractive to the inhabitants of Stod.

The recent discovery of tea residue in Gu ge illustrates that a far-reaching web of exchange encompassed Stod in the Protohistoric period. Lu *et al.* (2016) detected a biomolecular signature (comprised of caffeine, theanine and calcium phytoliths) for tea (probably *Camellia sinensis*) in a tomb at Gur gyam, confirming the existence of a system of physical exchange ultimately stretching between southwest China and western Tibet *c.* 1800 years ago. Until this study, the earliest recorded importation of tea to Tibet coincided with the Chinese T'ang dynasty.[51] The findings of Lu *et al.* (2016) suggest that a branch of the pre-classical 'Silk Road' penetrated western Tibet, connecting this rugged mountainous region to the wider cosmopolitan world of Central Asian and East Asian cultures and civilizations. According to Lu *et al.* (2016), tea in the Gur gyam burial was accompanied by vegetal traces (lemma phytoliths) of barley (*Hordeum vulgare*). This seems to document the presence of what is called *spag*, a staple food in Tibet, which consists of salt tea and parched barley meal kneaded together into a paste. It is likely that this edible mixture was deposited in the tomb as provisions for the dead in the afterlife or as appeasement offering as part of an elaborate series of funerary rites. The use of barleycorn and barley cakes in funerary rites is attested in Old Tibetan literature (Bellezza 2008; 2013). Imported materials and the ensemble of indigenous objects discovered in the tombs of Gur gyam confirm that Stod possessed a relatively sophisticated material culture in the Protohistoric period.[52] This is underpinned by the objects unearthed from other sites in Gu ge from the Late Prehistoric era, e.g. Gepa Serul (*c.* 1600–1100 BC), Chu 'thag/Chu mda' (*c.* 400–50 BC), Rgya gling thang/Dgon gling thang (775–140 BC), and Sangs dar lung mgo (*c.* 300 BC to AD 670).[53] Artifacts made from

[49] This site is described under the name 'Regiment Valley in June 2012 *Flight of the Khyung*: http://www.tibetarchaeology.com/june-2012/.

[50] Scherrer (1906: 336, 337) referring to the site of Ha la writes, 'it is said there used at one time to be a fairly large population, but for some reason the families all became extinct.' There are indeed abandoned farm fields and monastic facilities, residential structures, and two large fortresses in Ha la (Bellezza 2014c: 58–63). Just as impressive remains are found on the opposite bank of the Sutlej River at Dar sgam. The site consists of a large stronghold that sits atop a rocky eminence, which based on architectural criteria, was founded no later than the Early Historic period. The Dar sgam citadel completely occupies a summit (4175 m elevation) that is 202 m in length along its east-west axis. The installation boasts a dense collection of buildings constructed primarily of blue and tan sandstone slabs and blocks. Many of the structures were built with all-stone corbelled roofs. The stronghold can be divided into five sectors, which contain at least 146 buildings and rooms. According to the local oral tradition, the castle there was ruled by a figure called Dar sgam dpa' bo. There is also a collection of smaller residences just above sprawling fields that were once cultivated, a line of *mchod rten* (looted in the 2000s), and a lower complex of buildings in Dar sgam. Hundreds of people must have once lived in the castle and village but they were completely vacated before living memory. For more on Dar sgam mkhar (called Sutlej River Citadel), see May 2012 *Flight of the Khyung*: www.tibetarchaeology.com/may-2012/.

[51] The Lu *et al.* (2016b) study notes the discovery of tea plant residue in the Han Yangling Mausoleum near Xi'an (dated to *c.* 200 BC), which is among the earliest physical evidence in the world for tea as a culturally useful material.

[52] For the supporting evidence, see Institute of Archaeology, CASS and Cultural Relics Conservation Institute of Tibet Autonomous Region 2015a; 2015b; 2014; Bellezza 2020c; October 2010 and April 2012 *Flight of the Khyung*: www.tibetarchaeology.com/october-2010/, www.tibetarchaeology.com/april-2012/.

[53] On Gepa Serul, see Cao *et al.* 2022 Tashi *et al.* 2022. On Chu 'thag, see Institute of Archaeology, CASS and Cultural Relics Conservation

cane and birch bark recovered from the burials of Gur gyam and other cemeteries in Gu ge suggest that trade in common materials crossed over the Himalayan divide from northern India. Similarly, the diverse assortment of stone and glass beads discovered at Gur gyam and the nearby Mkhar gdong citadel point to India, Central Asia and other territories.[54] Thus an extensive exchange network encompassing Stod some 1800 years ago extended to North Inner Asia, Indian Subcontinent and China. As part of an economic regime of comparative advantage, the inhabitants of Stod are likely to have introduced their own raw materials into this vast network. These may have included gold, musk, wool, borax, salt, medicinal and economic plants, and other widely sought-after commodities. Archaeological findings and economic considerations strengthen the prospect that tea recovered in Gur gyam reached there from Xinjiang. This entry point seems to correlate better with the evidence gathered thus far, rather than postulating a system of circulation spanning the Tibetan Plateau.[55] Nonetheless, a definitive judgment on how tea reached Stod 1800 years ago requires dedicated enquiry, the essential elements of which include GIS analysis, field surveys and remote sensing to ascertain agents of transmission on a regional scale, as well as the development of a sound theoretical framework. There is no evidence yet that tea was a widely traded beverage in Stod 1800 years ago. The trace amounts recovered in a single burial could signal that it functioned as a prestige good and thus as a social marker of status, or that it was used for special ritual or ceremonial purposes. If tea was indeed reserved for the funerals of the social elite of Gu ge, alternative forms of exchange (religious, diplomatic, tributary, etc.), instead of economically driven imperatives, may be responsible for its appearance in Gur gyam.

In the Late Historic period, agricultural villages existed in certain lower elevation locales of Stod where water resources and soil conditions were adequate for cultivation, while in non-arable and higher areas semi-nomadic pastoralist encampments of black yak hair tents (*sbra*) proliferated. Larger aggregations of people gravitated around Buddhist monasteries, district headquarters, and on a seasonal basis at the international trade marts of Rgya nyi ma and Stag la mkhar. Town-sized populations came up around the monasteries of Bshad 'phel gling in Purang and Mtho lding, both of which more recently have belonged to the Dge lugs pa sect. According to Scherrer (1906: 154), Bshad 'phel gling housed 350 monks, while Mtho lding had 300 monks at the turn of the 20th century. The population of Mtho lding varied over its 1000-year existence, once reaching 1000 monks or so it is claimed in a local oral tradition.[56]

Institute of Tibet Autonomous Region 2015a; Chinese Institute of Tibetology, Sichuan University 2001b; Bellezza 2020c: 196, 197, 200, 214. On Rgya gling thang, see Bellezza 2008: 112, 114, 115; 2020c: 207; Aldenderfer 2018: 131–133, 135; Chinese Institute of Tibetology, Sichuan University 2001a. On Sangs dar lung mgo, see; Huo and He 2021; Xizang Zizhiqu Wenwu Baohu Yanjiusuo, Zhadaxian Wenwuju 2022.

[54] See Institute of Archaeology, CASS and Cultural Relics Conservation Institute of Tibet Autonomous Region 2015a; 2015b; Gleba *et al*. 2016; Bellezza 2020c: 202, 241 (n. 5); October 2017 *Flight of the Khyung*: www.tibetarchaeology.com/october-2017/.

[55] According to Lu *et al*. 2016, the presence of tea indicates that a Silk Road trade artery ran across the Tibetan Plateau from southwest China all the way to Ngari. The authors believe that this route was a precursor to the "Tea Horse Road", which passed through Yunnan, beginning as early as the seventh century CE. There is mounting evidence to indicate that trade in tea, horses, furs and medicinal plants flourished between eastern Tibet and western China. A so-called 'Tea Horse Road' that served as a conduit conveying trade goods onto the Tibetan Plateau during the Tibet Imperial period (*c*. AD 650–850) can be readily seen in the context of interactions between two important Asian empires of that time: Chinese (T'ang) and Tibetan (Spu rgyal). On this trade network, see, e.g. Fuchs 2008; Yang *et al*. 2021; as well as criticisms in Sigley 2013. However, virtually nothing is yet known about the potential existence of an analogous trade network traversing the Tibetan Plateau in the Protohistoric period. No epigraphic or archaeological evidence for appreciable Chinese cultural inputs has been detected in Upper Tibet and Central Tibet of the Protohistoric period. As the present author's research demonstrates though there is significant evidence for North Inner Asian technological and cultural influences having had a profound effect on Upper Tibet, especially in Stod. That tea was discovered near Xi'an, an eastern terminus of the Silk Road and earlier phases of trade, suggests that the movement of tea to Gu ge may have occurred via the geographically crucial Hexi Corridor and onward along well-established migratory routes around the Tarim Basin. Xinjiang (East Turkestan) was a key hub for trade and other forms of exchange, linking Central Asia, Tibet and Northwest China (Bellezza 2020a; 2020c). The discovery of silks in Gur gyam tombs from the same time frame as tea supports the existence of such an avenue of exchange. On these silks, see Institute of Archaeology, CASS and Cultural Relics Conservation Institute of Tibet Autonomous Region 2014; October 2010 and April 2012 *Flight of the Khyung*: www.tibetarchaeology.com/october-2010/, www.tibetarchaeology.com/april-2012/). That silk textiles as trade or diplomatic articles of Inner Asian or Chinese manufacture arrived in Stod via northern intermediaries is supported by the existence of ancient silks in Niya, Loulan, Shampula and other sites in Xinjiang. Bronze metallurgy on the Western Tibetan Plateau in the Iron Age also exhibits pronounced northern technological and cultural influences, with Xinjiang probably playing a significant role in its transmission southward (Bellezza 2020a; March 2016 *Flight of the Khyung*: www.tibetarchaeology.com/march-2016/; Li *et al*. 2022; Lu 2015). The use of golden burial masks in both Xinjiang and Stod during the Protohistoric period also indicates that seminal cultural themes diffused between these two regions. On these death masks, see November 2011 and November 2013 *Flight of the Khyung*: www.tibetarchaeology.com/november-2011/, www.tibetarchaeology.com/november-2013/; Bellezza 2023; Tong and Li 2016; Aldenderfer 2018; Massa *et al*. 2019. Indeed, Lancuo *et al*. (2019) associate tea and objects of the Protohistoric period excavated in Gu ge with routes leading to the southern margin of the Tarim Basin. A northern vector of transmission is also supported by the Upper Tibetan rock art record. A northern exchange nexus does not negate the likelihood that in early times the Western Tibetan Plateau was integrated into an exchange system embracing other parts of the Tibetan Plateau as well. However, the prevalence of diverse tribal groups and difficult terrain in southeast Tibet may have obviated the conveyance of tea from southwestern China directly across the entire Plateau. If a trade conduit traversing the Tibetan Plateau was responsible for the transport of tea to Gur gyam, it is more liable to have passed through Amdo and the Byang-thang, a geographically and ethnically interconnected expanse of lofty plains. In light of the archaeological findings and economic considerations reviewed above, rather than postulating a system of circulation spanning the Tibetan Plateau, Xinjiang is more likely to have served as an intermediary in the transfer of tea to Gu ge.

[56] Moreover, according to local legend, 3000 families once resided in Rtsa rang (10 km downstream of Mtho lding), but this is probably an

In the modern period under Chinese Communist rule, towns have been built in all of the county seats of Stod and one true urban centre has been established, the capital of Ngari known as Shiquanhe.[57] There are no reliable figures for the population of Stod in premodern times but it appears to have been falling in recent centuries. Local legends and anecdotal observations of Western travelers echo this supposition.[58] As for the population in ancient times very little can be said, save to venture that it was larger than in the Late Historic period.

Thanks to excavations of tombs carried out by Chinese archaeologists beginning in the 1990s much more is known about the Late Prehistoric era in Stod than on the Byang thang. This archaeological exploration has continued to the present day and is mostly focused on Gu ge, but work in other areas of Stod has been spotty at best. The only comprehensive surveys of archaeological sites visible on the surface in Stod and the Byang thang have been carried out by the present author. Rock art notwithstanding, the monumental record thus assembled furnishes the most comprehensive body of evidence for understanding the cultural complexion of the region in the Late Prehistoric era and Early Historic period now at our disposal. Various kinds of hilltop fortifications and elite residences, dispersed settlements, troglodytic communities, and a diverse assortment of tombs and other types of funerary structures have been recorded, which supply a continuous record of habitation and cultural development in Stod from the Late Bronze Age until the Vestigial period. 227 sites consisting of the remains of residential, ceremonial, ritual, and burial structures, which exhibit a wide spectrum of archaic morphological, design and situational features, have been documented in Stod and adjacent areas of the Western Byang thang that fall in the same counties.[59] These sites can be organised into four main categories: 1) fortresses and other residential installations built on summits;[60] 2) residential sites in other topographic aspects including dispersed settlements, aggregated settlements in defensible locations, and cave complexes;[61] 3) sites containing menhirs or long stones (*rdo ring*);[62] and 4) funerary sites including ritual and burial structures.[63] These four categories of monuments do not include archaic stepped shrines and more minor ritual structures scattered throughout Stod. On a county-wide basis the main categories of sites with archaic monuments are tallied below:

County	Residential Sites on Summits	Residential sites in other locations	Sites with Menhirs	Funerary Sites
Ru thog	40	19	6	24
Sgar	14	4	5	6
Rtsa mda' (Gu ge)	45	8	6	2
Spu rang	8	17	12	8

Like other lines of archaeological evidence examined above, the archaic residential, ceremonial, ritual, and burial structures established in Stod demonstrate that beginning in the Late Bronze Age or Iron Age the region had progressed well beyond societies segmented into roving bands of herders and hunters.[64] The large strongholds and necropolises that exist there indicate that a high degree of economic integration and socio-political consolidation had been achieved in the Late Prehistoric era. Advanced technological capabilities in other areas of craft and design as well as wide-ranging trade networks and intellectual exchanges were corollaries to the well evolved monumental infrastructure of Stod. Ambitious construction projects established for the exercise of political control and social influence strongly suggest that a deeply hierarchical society had taken root in the region. However it is still not known whether prior to the Imperial period the region was organized as one or more chiefdoms or had

exaggeration (Tucci 1935: 171). However, Tucci considers an older Jesuit estimate of the population at 500 to be too low given the vast extent of the ruins.

[57] According to Chinese census statistics on the website 'City Population' (https://citypopulation.de/), the population of Shiquanhe in 2010 was 10,507. Sgar County, in which Shiquanhe is situated, had a population of 16,901 in 2010 and 31,052 in 2020. Much of this population growth took place in the prefectural capitol, which is currently likely to have more than 20,000 inhabitants.

[58] Anecdotal observations of Western travelers furnish some context for further discussion. Scherring (1906:154) remarks that Mtho lding at the beginning of the 20th century was a mere vestige of its former size. Scherring (1906: 336) also comments that in the Gu ge villages of Khyung lung, Dongu (Spang bkra?), Gdong po, and Mda' pa most arable lands had been abandoned or remained fallow and most fixed residences were derelict. Tucci (1935: 102–107, 128, 130, 131, 182) reports a huge loss of population and great ruins on both sides of the Sutlej River in Gu ge. On the dereliction of Gu ge, see also Lama Anagarika Govinda 2005: 312–315.

[59] For a list of these sites and their locations, see tables and maps in Bellezza 2014a: 563–640; 2008: 651–744. Three hilltop citadels not included in these works are Ru se mkhar, Dar sgam mkhar Brag nag thom (sp.?), all in Gu ge. Also outstanding is a large residential site constructed on less defensible terrain above the pilgrims' circuit around Mount Kailash at 'Bri ra phug.

[60] On these sites more broadly in Upper Tibet, see Bellezza 1997: 373–387; 2001: 75–109; 2002: 17–44; 2008: 31–53; 2014c: 1–6, 29–275; 2020c: 275–303.

[61] See Bellezza 2001: 110–129; 2002: 45–78; 2008: 53–68; 2014c: 276–497.

[62] See Bellezza 1997: 366–369; 2001: 160–183, 2002: 102–122; 2008: 69–110; 2014a: 3–233; 2020c: 248–275.

[63] See Bellezza 2001: 148– 159; 2002: 79–101; 2008: 110–141; 2014a: 234–520.

[64] On the socio-political development of the region and of Upper Tibet more generally in the Late Prehistoric era, see Bellezza 2008: 569–572; 2020c: 239–303.

Figure Ib.4. All-stone corbelled residential structures in the west portion of the middle complex of a citadel called Jo mo ri rang mkhar (5060 m elevation), Spu rang.

Figure Ib.5. One of the many hybrid structures built with both all-stone corbelled and wooden roofs in the stronghold of Dar sgam mkhar (*c.* 4250 m elevation), Gu ge.

achieved the level of integration associated with an early state ruled by monarchs (Bellezza 2020c: 296–298).

The most distinctive form of archaic residential architecture in Stod features structures built entirely of stone with massive corbelled roofs (Figures Ib.4, Ib.5).[65] The settlement zone associated with all-stone corbelled buildings encompasses the Western and Central Byang thang, extending over a contiguous area from 88.2° E in the east to the western borders of Ngari (Bellezza 2011). Examples of this form of architecture are also found further west in Ladakh.[66] Adept building skills and ample economic resources and labour were needed, suggesting that all-stone corbelled buildings were occupied by those enjoying higher social positions. All-stone corbelled buildings employed wall corbels, bridging stones and slab sheathing to produce flat roofs. These extremely heavy roofs were supported by a series of thick walls, buttresses and alcoves that formed ground plans with irregular contours. The system of corbelling used in Upper Tibetan sites was only suited to the creation of rooms with a floor area of not more than 12 m² (the corbelled arch was not perfected in the territory). The entranceways are usually less than 1 m in height and walls are seldom punctuated by windows or other apertures. Wall were constructed of roughly hewn stone blocks and slabs and are both mortared

[65] For a description of the architectonic traits of this form of construction, see Bellezza 2008: 32–37; 2014c: 1–3; 2015; 2020c: 276–282.

[66] On the all-stone corbelled installations of Ladakh, see Devers 2016; 2014; Vernier 2012; June 2013 and September 2012 *Flight of the Khyung*: www.tibetarchaeology.com/june-2013/, www.tibetarchaeology.com/september-2012/. Two sites with all-stone corbelled edifices have also been documented in Mang mkhar, in Lha rtse (Central Tibet). See September 2010 *Flight of the Khyung*: www.tibetarchaeology.com/september-2010/.

Figure Ib.6. The all-stone corbelled stonework of structures in the upper tier of the upper edifice, East complex, Sman bla pho brang South (5080 m elevation). The site is perched above a tributary valley of the Mount Kailash pilgrim's circuit, Spu rang.

and of a dry-stone composition. 37 sites with all-stone corbelled edifices built on summits and isolated slopes were surveyed in Stod, but the actual number is greater because the architectonic traits of many residential ruins cannot be determined with any confidence due a state of advanced degradation. Sites frequently contain between five and 20 multiroomed buildings. Hilltop sites with difficult approaches, ramparts, circumvallations, and parapets are likely to have functioned as redoubts, but also as residences for high-ranking members of society and as garrisons. None of the all-stone corbelled structures have been dated directly. A small round of softwood recovered from under rubble inside a semi-subterranean dependency of Ge khod mkhar lung (Ru thog) built in this fashion has yielded a calibrated radiocarbon date of *c.* 200 BC to 100 AD (Bellezza 2014b: 3 (n. 1]; 2008: 37). This evidence, while tentative, indicates that these kinds of constructions were already being used by the late first millennium BC or beginning of the first millennium AD. Other sites with all-stone corbelled edifices are tucked away on steep rocky slopes, cliffs or on islands, also giving them a defensible aspect (Figure Ib.6). These installations were often built partially underground and many have niches and compartments in the walls. The removal of these sites from economically productive lands (pastures and fields) indicates that they were constructed for specialized purposes. Some all-stone corbelled buildings are suggestive of religious facilities, e.g. hermitages and temples. A large group of such complexes is distributed in the lofty side valleys of the sacred mountain Ti se (Kailash).[67] Some archaic hilltop strongholds were constructed with stone walls and timber roofs while still others were raised with mud bricks. Early mud brick strongholds are especially common in Gu ge, where stone was often in short supply (mud brick and rammed earth fortresses continued to be built in the Historic era). The origins of mud brick architecture on the Western Tibetan Plateau appear to extend back to the Protohistoric period (Bellezza 2020c: 290). Wood bonding materials inserted between the prominent stone revetment and adobe brick superstructure of a summit at Ru la mkhar (Gu ge) were subject to radiocarbon analysis, yielding a calibrated date of *c.* AD 565–705 (Bellezza 2014c: 271–275). This date appears to represent either the foundation or refurbishment of the building. The direct dating of bones and wooden members deposited inside structures with stone walls, at least some of which were erected with timber roofs, has been carried out at Mkhar gdong, the probable capital of the Zhang zhung polity. Calibrated radiocarbon dates point to a phase of occupation at the citadel beginning *c.* 400 BC but with a major phase of residency between *c.* AD 180–650.[68] Although probably functioning as a mausoleum rather than a residential structure, a building with stone walls and timbers has been dated to the AD 3rd to 5th century.[69]

The proliferation of strongholds in Stod implies a certain degree of militarism, a sociopolitical system of organization predicated on the preparation for and prosecution of war (Bellezza 2020c: 299). Particularly in Ru thog and Gu ge, the large clusters of analogously constructed strongholds established on summits,

[67] For the locations and names of these installations, see Bellezza 2008: 725, 743.

[68] For more on Mkhar gdong and a review of the archaeometric data from various sources, see Bellezza 2020c: 200–203; Aldenderfer 2018: 126.

[69] The site seems to be called Khyi nag 'bubs and is located in Gzhung pa ma tshan, Western Byang thang. It is dominated by a freestanding limestone structure. Two samples extracted from different load-bearing tamarisk beams embedded in the southwest wall have yielded a calibrated radiocarbon date of the 3rd to 5th century CE. See Bellezza 2008: 145, 146.

all-stone corbelled in the former area and mostly mud brick in the latter, allude to ramified networks of complementary facilities designed to ensure the political and economic dominance of a ruling elite. As the dating of the archaic fortresses and castles of Stod is still obscure, how many different installations may have been operating cooperatively in any given area and period remains conjectural. Clearly, the large residential installations that sprung up in Stod in the Late Prehistoric era represent a vital component of the armature of whatever polities (such as Zhang zhung) that sprung up there. Strongholds in Stod that were operational during the Imperial period became integrated into the political organs and infrastructure of the Tibetan empire. In the oral traditions of Stod, many of archaic strongholds of the region are said to have been established by the non-Tibetan Mon (called Mon gyi mkhar; Bellezza 2008: 43; Tucci 1935: 106). The Mon are also supposed to have founded villages, cave complexes and agricultural centres throughout Stod. They are regarded in local legends as an ancient tribe that inhabited all of Upper Tibet west of the 89th meridian sometime before the coming of Buddhism. Yet, as already explained, paleogenetic studies indicate that the forbears of the current Upper Tibetan population were anchored in the territory throughout the Late Prehistoric era. Thus, the attribution of ancient monuments to a foreign people is largely apocryphal. The Mon attribution in folklore has become a means to intellectually and emotionally distance local residents from their often-reviled pre-Buddhist past (Bellezza 2008: 116). It is still possible though that a ruling elite, or another demographic sliver of the ancient population of Upper Tibet, were of foreign origin.[70]

There are two important classes of archaic monuments in Stod and on the Central and Western Byang thang that are based on the prolific use of menhirs/monoliths, which are called long stones (*rdo ring*) or registers (*tho*) by Upper Tibetans. They consist of standing stones erected inside quadrate enclosures and rows of menhirs appended to what appear to be temple-tombs (Figures Ib.7, Ib.8). Like archaic residential structures, these two classes of monuments are high-water marks of indigenous cultural development in the Late Prehistoric era, and geographically distinguish the bulk of Upper Tibet from other regions of the Tibetan Plateau and surrounding territories on the Indian Subcontinent and in North Inner Asia. The walled-in long stones are comprised of one or more (up to 50) long stones planted near the west edge of a quadrate enclosure, which is comprised of masonry walls embedded in the ground (the original height of these walls is uncertain but are likely to have been under 60 cm). These enclosures are typically oriented in or close to the cardinal directions. They seem to have had funerary ritual and possibly commemorative functions but not sepulchral ones. Some of the walled-in long stones are flanked by other kinds of superficial funerary ritual structures and burials known as Mon dur (named after the legendary ancient tribe). 88 sites with walled-in long stones have been documented in Upper Tibet by the author. More imposing still are rows of long stones arrayed just east of a well-built edifice that seems to have functioned as both a burial space and ritual venue. Where sufficient structural evidence is assessable, these all-stone, windowless buildings were constructed with flat corbelled roofs, in the same manner as all-stone corbelled residential structures in Upper Tibet. 29 sites of these 'long stone grid necropolises' have been documented in Upper Tibet,[71] each containing one to six arrays of long stones with appended temple-tombs. They range in size from arrays with *c.* 100 miniature menhirs and edifices of just 3 m to 5 m in length to sites boasting multiple complexes, each with many hundreds of standing stones and temple-tombs up to 60 m in length. The largest example in Stod is Tho bo dmar hreng, a finely constructed temple-tomb (17 m × 10.5 m) and concourse of long stones that once numbered over 1200 and covered an area of *c.* 49 m × 18.5 m (Bellezza 2014a: 549–552). Radiocarbon data from an associated tomb in the Khang dmar rdza shag site on the Western Byang thang suggest that the long stone grid (LSG) necropolises may have been founded as early as the 10th or 9th century BC (Bellezza 2020c: 259–262; 2008: 91). In a recent work, the author considers how these necropolises bespeak a regime of socio-political consolidation and economic expansion in Upper Tibet during the Iron Age (2020c: 264–270). In assessing the role played by them in ushering in fundamental changes in the cultural complexion of Upper Tibet, comparative analysis of the better studied deer stone-khirigsuur (DSK) sites in Mongolia and Southern Siberia of the Late Bronze Age has proven to be of much utility. It can be concluded that the LSG necropolises embodied the most advanced architectonic and organizational features of their time and signify a remarkable concentration of political and economic resources in Upper Tibet. Undoubtedly, interment in these monuments and their ritual regulation were reserved for members of society enjoying high status and rank. Moreover, as they possess a unique suite of design, constructional and situational traits, the LSG necropolises and walled-

[70] Remarkably, an individual from the Sangs dar lung mgo cemetery in Gu ge and dated to *c.* 1900 years ago is a genetic outlier; sharing more than half of its alleles with a Bronze Age central Asian population distinguished by Indus River Civilisation, steppe pastoralist and Iranian farmer-related genetic lineages, which is indicative of a small-scale interaction in a limited time period, and may be related to trade ties. See, as above, Bai *et al.* (2024). In addition to postulating trade and migration to account for the mixed genetic ancestry of the outlying individual from Sangs dar lung mgo, other forms of cultural and demic exchange should also be considered as possible causal agents.

[71] I have been informed by colleagues that another example was recently discovered east of Mtsho ma pham.

Figure Ib.7. A quadrate masonry enclosure and U-shaped array of long stones near the west end, Khu se rdo ring (4960 m elevation), 'Brong pa.

Figure Ib.8. The concourse of long stones and the razed temple-tomb (top of image) of Dpa' mo 'dre 'khyer (*c.* 4380 m), Ru thog. Although smaller in size, this is one of the best-preserved arrays of long stones in a LSG necropolis of Upper Tibet.

in long stones serve as *sui generis* geographic markers of a distinctive monumental and cultural order that once overlaid much of Upper Tibet (Bellezza 2011). In Gu ge, LSG necropolises and walled-in long stones are only found in the extreme southeast of the region. In that part of Gu ge (Mon 'tsher Township) the badlands give way to higher and more open terrain that extends southeast to the lake basins of Mtsho ma pham and La lnga mtsho. Moreover, the range of funerary structures visible above ground in Gu ge is narrower than in many other parts of Stod and the Byang thang. At least some of the contrasts in the archaic monumental records of Gu ge and much of the rest of Upper Tibet appears to be the result of geographic imperatives. It was necessary for the monumental assemblage propagated in Gu ge to adapt to the more constrained terrain and unstable geomorphological nature of gorges and washes, as well as cope with the lack of suitable stones for construction in many places.[72] A walled-in long stone site is situated a little downstream and a LSG necropolis upstream of the burials with rich material cultural deposits discovered in Gur gyam.[73] This spatial interrelationship indicates that Gur gyam and other funerary sites in Gu ge belonging to the Iron Age and Protohistoric period that exhibit comparable sets of burial structures and objects are culturally related to the two major types of long stone monuments. These cultural affinities are reinforced by the existence of at least three different complexes of all-stone corbelled structures in the badlands of Gu ge.[74] Moreover, rock art in every part of Upper Tibet is closely aligned in all periods of its production, as seen in its parallel content and techniques of production. This cognate rock art furnishes additional evidence for an interwoven cultural fabric covering Upper Tibet including Gu ge.

What are primarily funerary ritual and burial monuments manifesting in various forms are well accounted for in Stod. They are of three basic types: walled enclosures, walled mounds, and cubic tombs erected on summits up to a height of 5600 m. The walled enclosures and walled mounds are distributed over the same areas of Stod and the Western and Central Byang thang as the all-stone corbelled edifices, while the cubic tombs have a more restricted geographic distribution in the higher reaches of Stod and the Western Byang thang The superficial structures visible aboveground vary greatly in size, intricacy of design, and quality of construction (Figures Ib.9, Ib.10). Little is known about their subsurface features. Although not all of these diverse monuments are necessarily mortuary or funerary ritual structures, many appear to have functioned as so (Bellezza 2008: 69–141; 2014a). Where examination of disturbed examples could be carried out, it can be appreciated that they are as morphologically diverse underground as they are on the surface. They vary in intricacy from shallow unlined pits to multichambered stone-lined compartments overlaid by large capstones. These various structures belong to a cultural tradition of burials and archaic death rites that can be traced back to *c.* 900 or 800 BC and which persisted in one form or another in Upper Tibet until *c.* 900 AD.[75] In the oral traditions of Stod, these monuments are commonly called Mon dur (Graves of the Mon). In Gu ge, there are special classes of funerary structures with little or no superstructures that were made throughout the Late Prehistoric era, which are classed by Chinese archaeologists as shaft tombs, stone mound tombs (with small heaped stone superstructures) and pit tombs (with and without stone chambers).[76] Some so-called pit tombs have passageways set at oblique angles that lead to the surface. The bulk of excavations carried out Stod since the 1990s have focused upon these types of funerary structures in Gu ge, some of which have complex subsurface architecture and abundant cultural and biological features. Like archaic residential structures, the funerary enclosures, funerary mounds, cave burials, mountaintop cubic tombs, shaft tombs, and pit tombs define the monumental framework of Stod in the Late Prehistoric era, which contrasts sharply with the architectural make-up of the territory that emerged with the diffusion of Buddhism in the Early Historic and Vestigial periods. The existence of substantial funerary ritual facilities and burial grounds are a good indicator of the magnitude of intellectual and technological progress attained in Stod in the Late Prehistoric era. Yet relatively little controlled excavation of funerary structures in Stod have been undertaken and does not yet extend to the many hundreds of structures documented by the present author. Hence the scope of material cultural assemblages and mortuary patterns of deposition associated with them in Stod and other areas of Upper

[72] Variations in the archaic monumental resources of Gu ge and the rest of Stod may possibly be reflected in a parallel geographic division noted in the Yungdrung Bon tradition. See Bellezza 2011: 61, 62.

[73] These sites are Smyon pa lhas rdo ring and Tho bo dmar hrang respectively See Bellezza 2014a: 69–72, 549–552. A very extensive site with walled-in pillars and ostensible funerary structures but with a unique mix of morphological features is situated in the Chu nag valley just 4 km from the citadel of Mkhar gdong. See Bellezza 2014a: 151–155.

[74] These three sites are Mon bu, Ba lu mkhar and Rdu ru can. On the former two sites see Bellezza 2014c: 170–173, 413–416. The latter site is described in Vol. IV of this series.

[75] On the oldest Mon dur type tomb on the Byang thang to yield a calibrated radiocarbon age, see Bellezza 2008: 91; 2014a: 133, 134; 2020c: 259, 260. On the termination of the Tibetan custom of burial in elaborate tombs, see Bellezza 2013: 119.

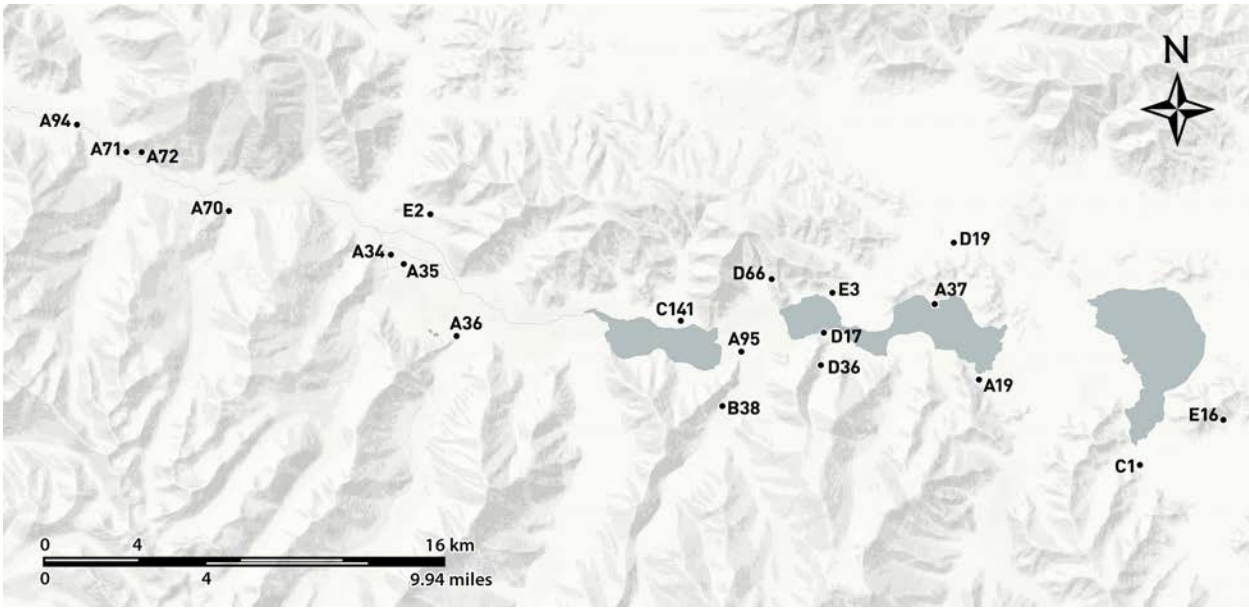
[76] Assessment of the cultural and historical implications of the peculiar tomb types of Gu ge and how these correspond to other areas of Upper Tibet is still pending. Interestingly, two large heaped wall enclosures have been documented on a small plateau situated at 4720 m in Gu ge (Bellezza 2014a: 351, 352). This site mimics the elevation, topography and structural typology of funerary structures on the Byang thang. As in Gu ge, in Spu rang smad, another lower lying agrarian region in Stod, ancient tombs are often concealed underground. They are occasionally encountered when construction of new buildings takes place. Unfortunately, the mortuary archaeology of Spu rang smad is still virtually unstudied.

Figure Ib.9. Probable funerary superstructures FS4 and FS5 (4580 m elevation), Bal tshwa gyang khrog, 'Brong pa.

Figure Ib.10. The remains of a slab wall funerary structure (4520 m elevation), Brag gtsug, Ru thog.

Tibet are still poorly known. A better understanding of the cultural and technological development of ancient Upper Tibet hinges upon the systematic excavation of a full spectrum of funerary structures and the archaeological, isotopic and molecular analyses of their contents.

Rock art in some sites of this volume is spatially related to funerary ritual and burial structures. The presence of mountaintop cubic tombs and other kinds of funerary monuments in sites S64–S67 suggests that they shared a complementary cultural relationship with rock art. At two of these sites, Rwa 'brog 'phrang (S65) and Skal khra mon dur (S67), rock art was carved on stones that make up the walls of funerary superstructures. Should it be established that these structures and petroglyphs were created in the same timeframe, this may indicate that at least some rock art was made as part of funerary observances, which possibly had ritualistic, sacrificial, devotional, or commemorative dimensions. Even if was to be proven that all rock art in the aforementioned four sites was created prior to or subsequent to the construction of the funerary structures, an indirect link between these two cultural manifestations is still probably indicated. Funerary structures and rock art belonged to an interrelated stream of human endeavour in Stod (and on the Byang thang) in whatever periods these two cultural manifestations may have surfaced. It is very unlikely that rock art makers and monument builders at the same sites pursued their craft without awareness of the existence of the other. Indeed, the lack of archaeological and genetic evidence for major demographic intrusions or wholesale population replacement in Upper Tibet from as early as the Late Neolithic/Bronze Age onwards encourages us to think



Map 3. The locations of archaic monuments in the vicinity of rock art sites S53 to S68 (with the exception of S54, S56 and S57), which are located in the Ra bang and Khul pa areas of Ru thog. For these rock art sites, see Map 5. These maps illustrate how rock art is spatially interrelated with archaic residential, ceremonial and burial monuments in an area with a high density of these sites. Alphabetical designations refer to monument types. A: residential sites on summits, B: residential sites in other aspects, C: sites with long stones (menhirs), D: funerary sites, E: cubic tombs on summit. The site names (from east to west) are as follows: E16 (Gyam chung mon dur), C1 (Ser mdzod rdo ring), A19 (Glog phug mkhar), D19 (Mi lhas 'khor mdo), A37 (Rmigs pa mkhar ru), E3 (Rtswa med god sa mon dur), D17 (Rwa 'brog 'phrang sgo), D36 (Sgog ra mon dur), D66 (Skal khra mon dur), A95 (Mthon kha lung mkhar), B38 (Mtha' ser gog), C141 (Dpa' mo 'dre 'khyer), A36 (Rtsa ma), E2 (Ri ra ser mon dur), A35 (Brag phug), A34 (Mtshe lung mkhar nag), A70 (Dung dkar mkhar gog), A72 (Skyung mo brag mkhar), A71 (Sra brtan mkhar), A94 (Rde'u nag gu mkhar).

along those lines. Any non-functional relationship between rock art and funerary structures may have been perceived in nominal terms of mutually reinforcing auspicious additions to the landscape. As two disparate anthropogenic modifications, rock art and funerary structures could still have been viewed in tandem through a mythological lens.

The existence of highly evolved residential, ceremonial, ritual, and burial monuments in Upper Tibet in the Late Prehistoric era signals that the territory had achieved a level of cultural, social, economic, and political advancement commonly associated with what is referred to as 'civilisation' (albeit at a preliterate and pre-urban stage of development).[77] With its dense concentration of monuments and their fairly high level of refinement, nowhere is this truer than in Stod. Hence Upper Tibetan rock art of the Late Prehistoric era was the fruit of a 'civilised' people, even if the stations in life of the makers did not necessarily embody the highest ideals and practices of their times. It is in this context, with its various implications for the human experience in the region, that rock art of the territory in the Late Prehistoric era must be considered. The exact nature of the relationships that rock art makers had to elite architecture would have been dependent on their social prestige, economic position, and political stature. The rock carvings and paintings of the Late Prehistoric era were made by persons that, at a minimum, were aware of the cultural and technological innovations unfolding around them. More likely, though, they were participants in these momentous activities in some capacity or other. It can be asserted that rock art producers themselves lived in, built, worked at, or at least knew of the extensive residential complexes in the general vicinity of the places where they carved and painted. Similarly, rock carvers and painters either constructed, presided over or were otherwise aware of the ceremonial and burial centres that sprang up around them. The accessibility of the rock art medium and the tools required to create it, the variable quality of execution, and the depiction of both mundane and extraordinary themes in pictorial form suggest that a relatively wide spectrum of ancient society may have been involved in its production. A high degree of social inclusiveness would have served to broaden the potential relationships that rock art makers had with elite monuments. The social, political and economic interplay between rock art and monuments outlined above is also applicable to the Historic era. Nonetheless, the reduced importance of rock art as a medium of

[77] On some of the defining criteria of this civilisation, see Bellezza 2008; 2014b; 2020a; 2020c.

expression in the Historic era suggests that its social value began to wane in the Early Historic period and by the Late Historic period it had been relegated to not much more than a form of doodling or graffiti. Firmer baseline dates are required for a finer grained analysis of the chronological links and social relationships incumbent in the rock art and monumental sites of Upper Tibet assigned to the Late Prehistoric era.

40 rock art sites have been surveyed in Stod, four of which contain pictographs, 35 petroglyphs and one both methods of making rock art. 16 of these sites are documented in the present volume while 24 sites farther west in Stod are included in Vol. IV.[78] The topography of rock art sites in Stod is characterized by natural parietal structures, open cliff faces and individual boulders. Limestone caves and overhangs were favoured for the production of pictographs and sedimentary (some slightly metamorphosed) escarpments, outcrops and boulders with relatively smooth-textured and regular faces for petroglyphs. The makers of petroglyphs habitually worked rock surfaces near ground level or more elevated ones that were easily accessible. Formations consisting of multiple rock panels were especially attractive to carvers, who used them to align petroglyphs in varying directions and inclinations. Multiple panels of rock also served as natural steps and ramps that were exploited to reach higher areas on the formations. Most petroglyphic sites in Stod that were established on escarpments parallel important channels of transport and communications. The placement of rock carvings in heavily trafficked locations indicates that they were made to be viewed by a wide cross-section of people. For instance S65 and S68 straddle lake basins and S56 occupies a geographic bottleneck. However, the nature of the cultural, social, political, or economic signals being broadcast by the rock carvings at such sites defy categorization and remain speculative. Other rock art sites, particularly those created in parietal structures (e.g. S54, S57) and in boulder fields (e.g. S66, S87) are removed from major transportation routes. These seem to have attracted rock carvers and painters for the discharge of special sets of activities and were not necessarily intended for widespread viewing. More isolated sites may have been established as purpose-built theatres or sanctuaries. Boulders ranging from less than 1 m across to 4 m in length often form large fields dispersed over fairly wide areas (e.g. S76, S86). In many examples, the petroglyphs of a discrete boulder were the handiwork of a single artist or group of artists working in concert. Such boulders served as an exclusive venue for showcasing the independent expression of an individual or closely related persons. We might infer from this that carvers were motivated to articulate or assert their personal qualities and exploits (e.g. hunting and combat) in relation to a greater social whole. Whether the observing side of this social equation embraced much of society to which the petroglyph makers belonged, or just to certain sections of it, cannot be determined from the graphic evidence. Hunting is a case in point: were venatic scenes created just to gain the attention of other hunters or were they intended for non-hunters too?

In the 16 main sites included in this volume and marked in Map 4, a total of 3712 rock art subjects have been inventoried separately.[79] Additionally, five petroglyphs were carved adventitiously on long stones at three different walled-in menhir sites (Figures 62, 63, 65, 66, 68). Of these 3717 subjects only 104 are pictographs, 2.8% of the total, a much smaller proportion of rock paintings as compared to the Byang thang. There are large petroglyphic sites in Stod: six of the 16 in this volume contain 300 or more subjects each. These include Sgog ra (748 subjects), Rwa 'brog 'phrang (723 subjects), Skabs reng spungs ri (433 subjects), Brag gdong East (422 subjects), Sna kha songs and Mtha' rung (415 subjects), and Brag gdong West (311 subjects) and make up 82.4% of the subjects surveyed individually in this volume. Like the Byang thang, the rock art of Stod was produced from the Late Bronze Age to the Modern period, a timeframe of roughly three millennia and varies greatly in content, style and execution. As already observed, thematically and stylistically, rock art in Stod is closely allied to that of the Byang thang. This permits us to speak of an integral tradition of rock art production in Upper Tibet extending from Gnam mtsho in the east to Gu ge and Ru thog in far western Tibet. This Upper Tibetan tradition betokens vibrant cultural, social, and economic links encompassing the entire territory, which emerged in the Late Bronze Age and persisted throughout the Late Prehistoric era and well into the Historic era. A deeply entrenched artistic and technological groundwork in the Upper Tibetan rock art zone notwithstanding, there are many unique and idiosyncratic rock art creations heralding the skills, proclivities and imagination of individual artists and groups of artists.

Generally speaking, Upper Tibetan rock art exhibits the strongest stylistic and thematic affinities with

[78] Some inhabitants of Upper Tibet recognize that petroglyphs and pictographs are an important historical resource made in the past by their ancestors. Nonetheless, many local herders and farmers believe that rock art was self-formed (*rang byon*) and reflects the holiness and magical qualities of the parent sites. See Bellezza 2001: 200, 201; 2002b: 348. Other local residents attribute rock art to a binary class of spirits known as the *lha 'dre*.

[79] In this work, each individual piece of rock art is called a 'subject'. The rock art of Upper Tibet is divided into two major categories of depiction: animate and animate. Animate subjects are subdivided into two major groups: anthropomorphic and zoomorphic (with therianthropic subjects also represented), while inanimate subjects include geometrics, architectural structures, symbols, and various minor compositions. Rock art is broadly classified chronologically as either belonging to the Late Prehistoric era (*c.* 1200 BC – AD 600) or Historic era (AD 600–1950). The basic terms, categories and chronology of rock art are defined in Section IIc of the work.

adjoining territories of the Tibetan Plateau and Himalayan rimland and progressively weaker links to Northern Pakistan and North Inner Asia (the topic of cultural propinquity shall be explored in Vol. V). The interregional links in rock art intimate manifold cultural, artistic and technological ties between Upper Tibet and its neighbours (Bellezza 2008; 2020a; 2020c; Bruneau and Bellezza 2013). Wang *et al.* (2023) detected a significant admixture of Central Asian lineages in ancient Upper Tibetans,[80] which furnishes an additional mechanism for explication of the pronounced aesthetic, intellectual and material influences emanating from North Inner Asia on rock art in Stod and the Byang thang. Models of transmission based on economic, political and cultural factors are supplemented by considering migration and demographic enrichment as formative causal agents as well.[81] Although the bulk of rock art in Stod and the Byang thang is cognate, regional variations characterised by alternative subjects, styles and themes are observable. The strongest regional idiom appeared in Ru thog with its distinctive anthropomorphic repertory. This includes mascoids (human faces and complete figures in emblematic form) and bi-triangular anthropomorphs (torsos often consist of two triangles placed apex to apex, wedge-shaped heads and stick arms and legs).[82] Primarily dated to the Late Bronze Age (but to the Bronze Age and Iron Age too), each mascoid exhibits a unique mix of facial features and sometimes arms and legs. Despite being confined in Upper Tibet to Ru thog, mascoids in differing styles and configurations occur in Spiti, Ladakh, Northern Pakistan, and various territories of North Inner Asia (Mongolia, Ningxia and southern Siberia, etc.). Bi-triangular anthropomorphs in Ru thog are assigned to the Iron Age and Protohistoric period and are commonly depicted brandishing weapons in martial sport and combat themed compositions. This style of anthropomorphic rock art reached its fullest expression in Ladakh where it is associated with a larger range of themes. The singular category of zoomorphic rock art in Ru thog consists of wild ungulates and carnivores with arcuate body ornamentation, which in this work is denoted the 'Eurasian Animal Style' (EAS).[83] Zoomorphs with arcuate body adornment are part of a wider tradition of Eurasian art articulated in various media that arose in the early Iron Age. This diverse assortment of objects and rock art is based on curvilinear schemata to which various motifs such as volutes, elaborate horns and pointed hoofs were added. Each area of Eurasia in the Iron Age, from Celtic Europe to Tibet and China, developed its own aesthetic and symbolic variants of the so-called Eurasian Animal Style. Therefore rather than representing a single style or expression, it constitutes an interlacement of sundry artistic traditions. To reiterate, mascoids and zoomorphs with arcuate body ornamentation relatable aesthetically and historically to those in Ru thog command a wide geographic purview. They function as markers of interactions between Upper Tibet and others parts of the Tibetan Plateau, Northen Pakistan, North Inner Asia, and beyond in the Late Prehistoric era.

The most common animal in the rock art of Stod is the wild yak. Between 846 and 966 of these large mammals have been surveyed individually in the 16 sites of this volume (they make up 23% to 26% of the total rock art). Nonetheless other wild yaks must be represented in the 'wild ungulate', 'indeterminate' and 'quadruped' categories of rock art. As seen in Vols. I and II of this series, the dominance of the wild yak is also uncontested on the Byang thang. No creature is as synonymous with Upper Tibetan rock art than this large, shaggy bovid that is specially adapted to high elevation conditions. Unusual renditions of wild yaks in Stod include a double-headed version (see inventory entry S65_L49_C1b) and two mating pairs (S60_L30_C1, S60_L30_C2).

[80] Wang *et al.* 2023 identify a source of genetic heterogeneity in Ngari coming from Central Asia: a 2300-year-old individual from a cemetery in Phyi dbang (Gu ge) the authors call Jiweng shares ancestry (*c.* 6% – 14%) with Bronze Age individuals from Turkmenistan and Iran; an individual from another cemetery of the same period in Gu ge known as Rgya gling thang also exhibits Central Asian ancestry, as did a person from the Zhangcun site west of Shigatse (possibly in Ngam ring County; *c.* 1520–1360 years ago). While occurring in a few other places on the Plateau, this Central Asian genetic component is most pronounced in Stod, indicating that demographic infusions from that territory were strongest in far western Tibet. The imprint of North Inner Asia in Upper Tibetan rock art is deepest in Stod (Bellezza 2020a; 2020c), mirroring the genetic findings of Wang *et al.* 2023. According to the more comprehensive findings of Bai *et al.* (2024), although western Tibetan populations exhibit highly conserved genetic components over the last 3500 years, they hold under 3% of their genetic heritage in common with central Asian or steppe populations, indicating that they shared limited or sporadic genetic interactions. Individuals sequenced from Gu ge sites (Sangs dar lung mgo, Phyi dbang and Rgyal gling thang) demonstrate that genetic affinities with central Asian populations increased marginally beginning *c.* 2300 years ago. As little is still known about early settlement patterns and population interactions in western Tibet, it has not been determined whether this emerging ancestry was the result of genetic admixture or an antecedent migration of a central Asian population to Ngari. See, as above, Bai *et al.* 2024. An individual from a famous cave burial in Rtsa pa rong sequenced and dated by Bai *et al.* (2024) to *c.* 350 years ago falls genetically somewhere between contemporary Tibetan and central and south Asian populations. The authors suggest that this may be related to conflicts with the central Asian Gar log; however given the age of the remains, this individual is more likely to possess a genetic profile associated with Ladakh.

[81] There appear to be comparative linguistic correlates to the archaeological and molecular data, which allude to the existence of a broad web of interchange in which the Western Tibetan Plateau, North Inner Asia and even Eurasian territories further afield were enmeshed. Walter and Beckwith (1997) argue that the Tibetan language contains diverse types of terms borrowed from an early Indo-European daughter language. Kogan (2021) maintains that the Zhang zhung language (once spoken in Stod and adjoining areas) exhibits certain vocabulary that rests upon an Indo-Iranian etymological stratum, which appears to have been derived, at least in part, from an early language spoken in lower Ladakh that probably belonged to the Dardic group. Zeisler (2023) holds that the important Tibetan root smra may ultimately have Eastern Iranian origins. See also Bellezza 2020a: 81 (n. 195).

[82] These two categories of rock are investigated in Bellezza 2020c: 320–336. For mascoids, also see Bruneau and Bellezza 2013: 40–45, 68–71; Bellezza 2014b: 182, 195, 196.

[83] This type of rock art is the focus of enquiry in Bellezza 2020a.

Other common wild ungulates in the rock art sites of this volume are wild sheep (137–152 specimens), deer (91–106 specimens), antelopes (52–65 specimens), and Tibetan wild asses (*c.* 15 specimens); their relative proportions accord well with those on the Byang thang. Like the Byang thang, another common taxa in Stod is the carnivore (wild and domesticated; 113-154 specimens). Birds (mostly raptors) are fairly common in Stod rock art with 30–33 specimens represented in this volume. Between seven and nine of these birds are horned eagles (*khyung*), one of Tibetan world's most popular mythical creatures, an ancient clan symbol and protective deity of Upper Tibet. Rarer zoomorphic depictions include four to six examples of the Bactrian camel (e.g. S68_L26_C12a, S68_L26_C12f). Bactrian camels are found in two hunting compositions (S53_L9_C1f, S59_L2_C20c), suggesting that wild variants once ranged in Stod, as they still do in northeast Ladakh. Still rarer animals in the rock art of this volume are two fishes (S60_L24_C10, S60_L24_C11) and two or three lizards (e.g. S65_L86_C1, S65_L86_C2).

Between 3124 to 3274 rock art subjects inventoried individually in this volume, 84% to 88% of the total, are assigned to the Late Bronze Age (*c.* 1200–700 BC), Iron Age (*c.* 700–100 BC) and Protohistoric period (*c.* 100 BC – AD 600).[84] Rock art belonging to the Late Prehistoric era is well distributed throughout the region, as it is in the Western and Central Byang thang. Like rock art of the Late Prehistoric era on the Byang thang, that of Stod is characterized by several major themes that shaped the thrust of most compositions. These include 1) solitary and group portraits of animals and birds, 2) hunting scenes, 3) natural predation scenes, 4) alternative scenes featuring anthropomorphs and zoomorphs in close association, 5) solitary and paired anthropomorphic portraits, and 6) symbolic subjects, of which the swastika is paramount. Unidentified and more minor compositions (e.g. simple geometrics, desultory lines, scribbles, etc.) aside, more than 90% of all rock art compositions attributed to the Late Prehistoric era in Upper Tibet is counted among these six overarching themes. The fairly restricted range of compositions in the Late Prehistoric era is indicative of systems of social organization and economic production that were not as diverse as those prevailing in the Historic era. The cultural and artistic amalgamation of Upper Tibetan rock art sites notwithstanding, each locale has its own complement of thematic, subject and stylistic characteristics. Thus the proportion of each of the primary rock art themes, if they are represented at all, varies quite widely in Stod on a site by site basis.

Probably the largest group among the six major categories of depictions in rock art of the Late Prehistoric era is zoomorphic portraiture and is comprised of compositions in which one or more animals is portrayed in isolation. By far the most common animal shown is the wild yak, but deer, wild sheep, equids, antelopes, carnivores, and birds are also represented. Many of the animals limned seem to be mundane creatures, but in other compositions they may portray archetypes or paragons of the likened species as well as numinous variants. That some animal portraits could depict specimens with enhanced identities is supported by the lavish depiction of wild yaks with draped belly fringes and exaggeratedly long horns or stags with intricate antlers.[85] Compositions featuring solo raptors with spread wings also seem to be redolent with meaning that transcends their mere biological status. Certain compositions sporting wild ungulates are adorned with swastikas, sunbursts and crescent moons, which suggests that mythological and cosmological calculations played a role in their depiction.

As on the Byang thang, hunting themed rock art is very common in Stod. 92 hunting scenes have been positively identified and another 71 tentatively so in the 16 sites documented in this volume (a statistical analysis of subjects and compositions is planned for Vol. V). These compositions consist of between two and fifty subjects (the two largest are S63_L1_C1 and S68_L27_C5). Like the Byang thang, hunting was conducted on foot and horseback and almost exclusively with bows and arrows.[86] However a few hunters are shown equipped with lassos or supplementary implements. Mounted and ambulatory hunters are frequently accompanied by sleek-bodied hunting dogs. Quarry consisting primarily of wild yaks but also deer, wild sheep and antelopes are depicted being pursued. Standing archers are sometimes shown using a perspective where they appear to be positioned perpendicular to their prey, which seems to signify that they are lying in wait or launching a surprise attack. In other compositions, archers on foot confront wild yaks or other wild ungulates head on in what appear to be brazen demonstrations of skill and valour. Many hunting compositions show archers drawing their bows, which either represent taking aim or the very instance an arrow is being released. With the graphic evidence available it cannot be determined

[84] Discrepancies in the number of subjects belonging to any one period reflect uncertainties inherent in the chronological system of rock art classification used in this work. Therefore some subjects are attributed to two periods instead of one. For a discussion of this matter, see Section IIc.

[85] Bellezza 2008 (171, 173–175) considers that solo zoomorphic portraits may variously have been made as aesthetic or recreational exercises; magical charms designed to increase the fertility of game; thaumaturgic instruments for the successful outcome of hunts; tributary offerings or expressions of thanksgiving; religious and social symbols pertaining to ancestral, clan, territorial, and other types of protective ties; divine emissaries of the afterlife; and as transformative forms of adepts and priests.

[86] On hunting rock art in Upper Tibet, see July, August and September 2016 *Flight of the Khyung*: www.tibetarchaeology.com/september-2016/, www.tibetarchaeology.com/august-2016/, www.tibetarchaeology.com/july-2016/.

which action is intended. Nevertheless, as a successful outcome underlies venatic scenes as a convention, it is more plausible that hunters are being captured in the very act of slaughtering animals, rather than in the more equivocal stage of simply aiming an arrow. In some hunting scenes archers on horseback turn to face backwards when shooting (e.g. S63_L20_C6, S66_L90_C1j). This manoeuvre is commonly referred to as the 'Parthian shot'; however the rock art record demonstrates that it was already known in Upper Tibet by the Iron Age (cf. Bellezza 2020c: 271). Like most other motifs in Upper Tibetan rock art, the depiction of the bow and arrow tends to be cursory in nature or highly stylized, but more fully formed examples often picture the S-shaped bends of the recurve bow, an improved weapon type that appears to have been developed in North Inner Asia in the Late Bronze Age.[87] Some compositions revel in the gory details of game in the throes of death, which is illustrated bleeding from the mouth or other parts of the body. Wild yaks and other wild herbivores are sometimes exhibited already struck by arrows. That artists did not shy away from sanguinary aspects of the hunt exudes a certain pride in the killing abilities of hunters. The tactical prowess of ancient hunters is on display in many rock art sites on the Byang thang and in Stod. Mounted archers are sometimes presented attacking prey from all angles as they close in for the final kill. The outflanking, double envelopment and encirclement of fast-moving animals such as the wild yak required careful planning, organization and execution, which in turn demanded advanced capabilities in reconnaissance, multilateral deployment of horsemen and ambulatory huntsmen, synchronization of approach, and concerted assault (cf. Bellezza 2020c: 482). That hunting rock art served as a mechanism of social cohesion and group identification can be assumed. Its prosaic economic and social functions like providing meat and showcasing the virility of hunters aside, hunting compositions in Upper Tibet were probably imbued with deeper abstract connotations. However, as the conceptual and imaginary elements of hunting scenes are not explicit to modern observers, any assertion of their subtle nature remains speculative. A discussion of possible abstract functions revolving around ritualistic, cosmological and mythological themes is planned for Vol. V. The prototype for big game hunting scenes in Upper Tibet emerged out of the Late Bronze Age, which was preceded by analogous themes in Ladakh of the Late Neolithic/Bronze Age. Late Bronze Age and Iron Age compositions featuring the slaughter of large herbivores are also prevalent in the rock art of the grasslands of north-eastern Tibet. The fundamental scene architecture of big game hunting on the Tibetan Plateau owes much to North Inner Asian cultural precursors.

[87] On the introduction of the recurve bow in Tibet, see Bellezza 2020c: 213, 226–228, 271.

Parallel to hunting scenes, and even sometimes part of the same compositions in Upper Tibet, are natural predation scenes. These feature wild ungulates (wild yaks, wild asses, stags, wild sheep, etc.) being pursued and attacked by wild carnivores (wolves, felids). The identity of the wild ungulates involved in compositions are often unambiguous, but wild carnivores are harder to recognize. In many compositions the rendering of carnivores was done in a more rudimentary fashion than wild ungulates. This illustrational bias extends to hunting scenes where, for example, significant effort was frequently made to carve wild yaks, while accompanying hounds are smaller and cruder undertakings. Thus it is frequently unclear whether a wolf or a felid (tigers, snow leopards, lynxes) is intended in compositions featuring natural predation. In some cases long-tailed carnivores are striped or spotted, which recalls the tiger and snow leopard respectively. Subjects with long tails that curl over the back are also reminiscent of felids. The gaping jaws, pricked ears and extended claws of certain specimens, and their close proximity to wild ungulates, are other tell-tale traits of wild carnivore rock art. Yet in some compositions it cannot be determined whether a subject represents a carnivore or equid. As the majority of carnivores in the rock art of Upper Tibet have long, thin bodies and tails, bears do not appear to figure prominently in hunting spectacles. Moreover foxes with their bushy tails are hardly represented. Knowledge of the ecological cycle of prey and predator was central to the expression of predation in rock art, but the deeper meaning attached to these scenes remains difficult to discern. The preoccupation of ancient artists with predation mirrored their fascination with the workings of the natural world around them (Upper Tibet is still home to relatively large populations of wild carnivores and herbivores). By virtue of frequently being part of the same composition or group of compositions in which venatic themes are present, it appears that animal attack scenes served as exemplars or prototypes for hunting by humans. In this regard, huntsmen seemed to have drawn inspiration from or emulated the fierce meat-eating creatures with which they shared their homeland. The intimate relationships between humans and carnivores recorded in the Tibetan textual and oral traditions support this hypothesis, in that meat-eating animals function as ancestral figures, protective spirits and tutelary deities, etc.

Other kinds of human-animal interactions are also depicted in Upper Tibetan rock art of the Late Prehistoric era, where these two forms of life are shown in close proximity to one another in non-threatening aspects. Wild ungulates were sources of nutrition and useful products and objects of wonder since time immemorial. Thus some of these scenes may have been made as paeans or dedications to the natural world. Nevertheless, the dynamic between humans and wild herbivores does not always readily admit of utilitarian functions (e.g.

see S53_L1_C1, S53_L6_C2, S55_L2_C6, S60_L28_C3, S65_L53_C1, S66_L51_C1). More abstract calculations seem to be veiled behind such rock art compositions. The close physical association of animals with humans potentially underpins the depiction of ritualistic, mythic and mystic phenomena. While not readily apprehensible in the lineaments of compositions, religion-related functions are in line with the multifarious roles accorded wild animals in the textual and oral traditions of Tibet. Although these written and spoken traditions belong to the Historic era, some of their fundamental motifs appear to be of much greater antiquity (zoolatrous traditions will be explored in Vol. V).

Solitary anthropomorphs in various styles and aspects, some of whom are shown holding implements, are one of the most evocative components of the rock art record of Upper Tibet in the Late Prehistoric era (e.g. S55_L10_C12, S63_L1_C14, S65_L37_C3, S65_L43_C1, S65_Lx_C20, S66_L62_C5, S68_L50_C1). However as on the Byang thang, these figures are not common in Stod. They include a few pairs of anthropomorphs that seem to signify allies or conjugal partners (e.g. S65_L30_C5, S65_L40_C1, S65_L61_C9, S66_L28_C1). Among the 279 to 281 horseback riders inventoried in this volume, relatively few portraits of horsemen have been positively identified (e.g. S63_L1_C7, S65_L_32_C7, S65_L60_C20). There are also one or two compositions of an anthropomorph leading a horse (S53_L6_C7, S55_L44_C4). Most horseback riders though figure in hunting scenes. Upwards of four yak riders are also portrayed (S62_L14_C19a, S63-L12-C2a, S63_L20_C2a, S66_L51_C1h), suggesting that this domestic animal was used as a conveyance in the region, as it was in more recent times. Still, at least two of these compositions may possibly portray divine figures mounted on wild yaks (S62_L14_C19a, S63_L20_C2a). Certain unusually styled anthropomorphs appear to have been accorded special identities as heroic, sacerdotal or divine figures (e.g. S53_L6_C7e, S59_L2_C22a). Among the most appealing anthropomorphs are those that invoke a preternatural temper. Two of these unusual figures are depicted with a tail and horns (S53_L6_C13, S53_L7_C1b). Others compositions also feature anthropomorphs endowed with zoomorphic qualities (e.g. S59_L2_3a, S59_L2_C3c, S65_L53_C1f). One or two compositions are devoted to birth giving figures, which appear to be laden with symbolic meaning (S61_C9, S66_L74_C1i). Compositions featuring martial sport and combat scenes in Upper Tibet are most common in Ru thog. Ru thog borders Ladakh and its geographic centrality may have contributed to the heightened depiction of conflict there. Typically, two or more opposing figures engage one another with bows and arrows, pole weapons, swords or clubs, and shields (e.g. S60_L17_C1, S63_L1_C21, S65_L38_C10, S65_L68_C1, S66_L72_C1, S66_L85_C1, S68_L27_C7, S68__L52_C1). There is also what appears to be a composition illustrating pugilism (S63_L1_C19). Mascoids, highly stylized anthropomorphic forms in which the face is the dominant feature, appear with and without appendages (e.g. S65_L52_C5, S66_L8_C1, S66_L24_C1). Some specimens with arms are shown displaying weapons that include the bow and arrow and possibly a spear with flag attached. 38 to 43 mascoids were surveyed in the rock art sites of this volume.

The symbolic repertory of rock art in Stod closely matches that of the Byang thang. Like other regions of Upper Tibet, the most common symbolic subject is the swastika, a symbolic device of great consequence in all periods of rock art production. However, the incidence of swastikas in the rock art of the 16 sites surveyed in this volume is significantly lower than on the Byang thang. Only 30 examples oriented in both directions have been inventoried, of which nine to 11 are assigned to the Late Prehistoric era (e.g. S54_L1_C1g, S62_L14_C17b). There is a lower frequency of symbolic subjects in Stod more generally as compared to the Byang thang. An important factor in explaining this is the small body of rock art dating to the Historic era in Stod. Many symbolic subjects on the Byang thang, particularly the swastika, are part of compositions whose creation appears to have been tied to sectarian motives. Another symbolic subject in Stod that is characteristic of rock art across Upper Tibet is the sunburst. 16 examples have been surveyed in the sites covered in this volume, all but one of which are attributed to the Late Prehistoric era (e.g. S55_L7_C5, S66_L7_C1o). Many sunbursts were made in conjunction with animals, which is suggestive of the life-giving properties of the sun. Four or five crescents, a lunar symbol, occur in the sites included in this volume, all dating to the Late Prehistoric era. Of the swastikas, sunbursts and crescents enumerated above, one of each appear as a triad in a larger composition (S65_L53_C1a to S65_L53_C1c). In this sun-moon-swastika triad the swastika assumes the central position, which appears to indicate that it was invested with a more central cosmological status than either the sun or crescent moon. This set of cosmological signs is one of the most unique symbolic compositions on the Western Tibetan Plateau (also found in Spiti and Ladakh). In another composition characteristic of rock in Upper Tibet, the crescent is paired with a swastika (e.g. S62_L7_C8a, S62_L7_C8b). Also documented in the sites of this volume are four conjoined sun and moon symbols, two or three of which belong to the Late Prehistoric era (e.g. S66_L24_C1, S62_L7_C8). As on the Byang thang, early examples of the conjoined sun and moon documented in Stod corroborate its use long before it gained popularity as a tantric symbol in the Early Historic period (e.g. S54_L1_C1a, S59_L2_C40b). Only three trees were recorded in the rock art sites of this volume, two of which are attributed to the Late Prehistoric era (S54_L1_C1c, S65_L53_C1h). In an Early Historic-period context, trees functioned as cosmological motifs and ritual objects, but how this lore may might be applicable to antecedent rock art is difficult to ascertain. 16 of the 53 or 54 swastikas,

sunbursts, crescents, and trees surveyed in this volume constitute pictographs, more than 14% of the total, a much higher proportion than all pictographic rock art included in this volume (2.8%). This reveals a cultural bias (also present on the Byang thang) for producing the symbolic repertory using pigments.

Rock art of the Historic era makes up only 12% to 16% of all subjects in the 16 sites of Stod documented in this volume. Rock art of the Early Historic or Vestigial periods consists of 299–453 subjects, while 52 are assigned to the Vestigial or Late Historic periods, 21 to the Late Historic period only, and four dating to the Late Historic or Modern periods. Rock art in Stod of the Late Prehistoric era acted as a magnet, pulling in artists of the Historic era to make successive contributions in the same locations. Most rock art of Stod produced during the Early Historic and Vestigial periods continued to conform to modes of subject and scene selection established in the Late Prehistoric era, just as on the Byang thang. Zoomorphic and anthropomorphic portraiture, hunting scenes, combat and/or martial sporting scenes, and cosmic symbolism bridged the prehistoric-historic divide throughout Upper Tibet. Rock art assigned to the Late Historic period is decidedly less common in Stod than it is on the Eastern Byang thang and occurs at far fewer sites (rock art of the Modern period is uncommon in all parts of Upper Tibet). Ancient traditions of figuration continued even in recent centuries with artists often remaining true to earlier subjects and themes. These perdurable aesthetic continuities in the artistic output indicate that a peculiar mix of cultural and social forces continued to mould rock art production for a very long time. Nevertheless, by the close of the Vestigial period rock carving and painting were in steep decline. The heavily curtailed production in the Late Historic period was a mere echo of antecedent artistic traditions.

Although the thematic continuity exhibited by much rock art in Stod and in other parts of Upper Tibet in the Early Historic and Vestigial periods demonstrates that there was no large fissure in the pre-existing cultural groundwork, a new body of religiously themed rock art appeared. This novel religious art would prove historically very significant. That Upper Tibet had entered a more advanced social, economic, and political regime in the Early Historic period is borne out by the appearance of a broader rock art repertory (figurative and symbolic). This is mirrored in the historical record, for in the 7th century AD much of the Tibetan Plateau came under imperial rule. The Tibetan empire tightened its political and territorial grip in Inner Asia until reaching its greatest extent in the 8th century AD and first half of the 9th century AD. The formation of the Tibetan empire and its multifarious contacts with foreign peoples inexorably altered the cultural fabric of Upper Tibet and other territories on the Tibetan Plateau. Among the greatest cultural feats of the Imperial period (*c.* AD 600–850) was the invention of a system of Tibetan writing and the introduction of Indian Buddhism. Rock art of the Early Historic period reflects these two major cultural achievements, as Buddhist-inspired religious symbolism and Tibetan inscriptions appeared in sites throughout Upper Tibet (Bellezza 2020b). The rise of new channels of religious belief and devotion added an exceedingly influential dimension to the rock art corpus of Upper Tibet in the Early Historic and Vestigial periods. Although not as well distributed or as diverse as on Byang thang, the religious rock art that came up in Stod in the Early Historic and Vestigial periods underlines distinct sectarian affiliations. The study of Tibetan historical literature buttressed by the rock art and epigraphic records attests to the presence of two major religious orders surfacing in Upper Tibet in the Early Historic period: Buddhism and non-Buddhist entities. Very much has been written about the introduction of Buddhism in Tibet and its doctrinal and ecclesiastic underpinnings and readers wanting to learn more are encouraged to consult the voluminous literature. The category of non-Buddhist religion, however, requires further explanation because it is not so well appreciated. As used in this work, the term 'non-Buddhist' refers to various religious traditions and adherents known to Tibetans as *bon* or *bon po*.[88] A blanket native category, *bon* embraces disparate priesthoods, beliefs and ritual practices believed to have circulated in the Late Prehistoric era (how these personnel and their doctrines and institutions may have been organized and supported economically remains obscure). The term *bon* is also used in the written and oral traditions to denote the successors to pre-established religious customs and lineages that operated in the Early Historic period. As an alternative and largely indigenous religious system, the *bon po* operated independently and in parallel with Buddhism in the Early Historic period, at least at first. Nevertheless, over time there was much intellectual and artistic crossover between Buddhism and those still identifying as non-Buddhists, which culminated in the late 10th and 11th centuries AD in the emergence of a syncretistic religion known as Yungdrung Bon.[89] The rock art and epigraphy of Upper Tibet constitute two of the most undiminished bodies of evidence documenting the Buddhist and non-Buddhist systems of religion and the interactions that took place between them in the Early Historic and Vestigial periods.

In Stod, as elsewhere in Upper Tibet, the two fundamental categories of religion, Buddhist and non-Buddhist, were

[88] There is a growing body of scholarly literature on the ancient *bon po*. For bibliographic information and further background, consult this author's various publications. Also see, Bon Bibliography by the 'Tibetan and Himalayan Library': https://collab.its.virginia.edu/wiki/bibliographies/Bon%20Bibliography.html; Bon Bibliography by Dan Martin (2020): https://sites.google.com/view/bonbiblio/home.

[89] On the relationship between *bon* traditions and the Lamaist religion of Yungdrung Bon, see Kværne 1972; Karmay 1998; Bellezza 2008; 2013; 2014d.

articulated through the manner in which swastikas were oriented (e.g. S56, S58, S60). Unlike the Byang thang, however, swastikas facing in both counter-clockwise (non-Buddhist) and clockwise (Buddhist) directions were not usually added to the same rock surfaces in a disorderly or ad hoc fashion in the sites surveyed in this volume. Sectarian distinctions associated with the orientation of the swastika can be traced to the Imperial period, a by-product of ideological differentiation between Buddhists and those maintaining a religious order based on older indigenous or hybridized traditions. 105 stepped structures (*mchod rten* and *gsas mkhar*) were inventoried in the sites of this volume, in sharp contrast to Stod where only four or five of such religious representations are recorded. The differentiation of stepped structures into those made by Buddhists and non-Buddhists is not always possible, because these two religious traditions shared many motifs in common in the Early Historic and Vestigial periods. At any rate the majority of them in Upper Tibet seem to have been made by non-Buddhists. Some stepped shrines though are unmistakably Buddhist productions (e.g. S54_L2_C7c, S65_L76_C1a, S65_77_C1). That Stod borders on Ladakh, a region of the Western Tibetan Plateau in which stepped structure rock art was prolific from the Protohistoric to Vestigial periods, helps account for its strong presence there (Bellezza 2020b: 61, 62, 70–72). A salient sectarian marker in the rock art of Stod is the ritual thunderbolt (*rdo rje*) of Buddhism. Seven of these subjects have been surveyed in this volume (e.g. S66_L86_C2c, S68_L1_C9). Another religious symbol is the ritual vase (*bum pa*), but it is not known to which religious tradition the single specimen of this volume belonged (S68_L1_C9). The religious identity of the only endless knot symbol found in the 16 sites covered here is also ambiguous (S56_L3_C6). While rare, Lamaist personalities and deities are depicted in Stod (S65_L46_C1, S65_Lx_C6). In contrast to the Byang thang, non-Buddhist stepped structures, swastikas and other rock art subjects were generally left unmolested in Stod. There is little evidence in the rock art of this volume for contending religions placing their rock art on top of one another or otherwise encroaching upon the artistic expression of the other. Nevertheless, Stod was not immune to the sectarian struggles that erupted on the Byang thang in the Early Historic and Vestigial periods.[90] Sectarian tensions seem to be articulated in the inscribing of a *ma ṇi* mantra over a stepped structure (S55_L39_C1). A sectarian dynamic is also discernible in a Buddhist mantra carved over the likeness of an ewer (S65_L71_C1); however, it is not clear whether this involved Buddhists and non-Buddhists or just two different sects of Buddhism. In the second half of the 10th century AD and early 11th century AD, Nyi ma mgon and his royal successors consolidated their political control over Stod, establishing the Gu ge-Spu rang kingdom. The presence of this powerful kingdom in Stod and its adoption of Buddhism as the state religion had far-reaching effects on the society and culture of Ngari. One such impact appears to have been the relatively rapid conversion of non-Buddhists to the prevailing faith in Stod. Unlike the Byang thang, where serial amendments to rock surfaces by rock art makers and epigraphers suggests that the contending religious traditions were embroiled in protracted encounters, no such long-term struggle is evident in Stod. Moreover, there is hardly any record of a backlash against the old religion, as manifested in the integrity of its rock art, at least in the Vestigial period. However in the Late Historic period there are numerous instances of rock art of the Late Prehistoric era being disfigured by the carving of Buddhists mantras and prayers in relief over it. This state of affairs announces an ignorance of or disdain for the older religious traditions.

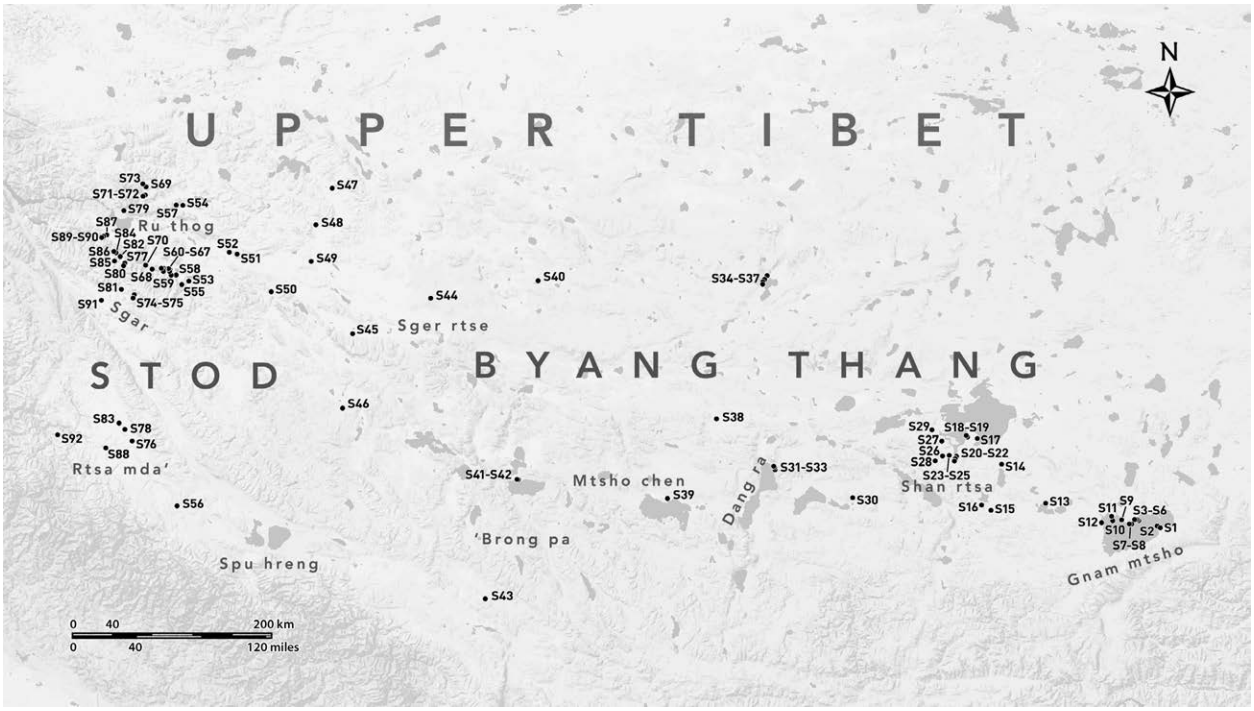
[90] Legal dimensions to the Buddhist conversion of western Tibet to Buddhism are documented in a recently discovered decree issued by Lha bla ma ye shes 'od, the second ruler of the Gu ge-Spu rang kingdom (947–1024 CE). From its various clauses, the objective of the royal decree is apparent: the dismantling of the old religious establishment through the abolition of key traditions and the undermining of any ideological accord between it and Buddhism. See May 2015 *Flight of the Khyung*: http://www.tibetarchaeology.com/may-2015/.

Ic. Rock Art Sites of Upper Tibet

To fix the locations of rock art sites as accurately as possible, GPS coordinates (latitude and longitude) are furnished for most in the Table below. For rock art sites occupying large areas, the coordinates provided are for a centralized location within them. A variety of handheld consumer-grade GPS (Global Positioning System) units have been employed in the field to obtain the GPS coordinates of rock art and other types of archaeological sites in Upper Tibet since 1999. GPS units have varying levels of accuracy. In general terms, the GPS coordinates of rock art sites provided should be accurate within a radius of *c.* 15 m – 30 m, however the standard deviation for any specific set of coordinates provided in this work remains unknown. In addition to inherent technical limitations pertaining to receiver design and quality, other factors that help determine the accuracy of a GPS unit include satellite geometry, signal blockage, atmospheric conditions, and topography; reduced battery power can also affect the sensitivity of GPS readings. It must also be noted that GPS base stations were not established in the field (these are used to introduce a correction factor to the GPS signals received). All coordinates in this work are given in decimal degrees.

* The geocoordinates provided for S26 and S33 have not been GPS verified.

This volume covers Site 53 to Site 68. Additionally, there is rock art documented on long stones in Rgya steng 'bur rdo ring, Ma mo rgya lhas rdo ring, and Smyon pa lhas rdo ring. The geocoordinates of these sites are given in the descriptions provided in the Inventory at geographically appropriate intervals.



Map 4. The locations (digital degrees) of rock art sites in Upper Tibet surveyed in this work.

Site No.	Site Name	North Latitude	East Longitude
Site 1	Bkra shis do chen	30.775956	90.867194
Site 2	Bkra shis do chung	30.766667	90.9
Site 3	Rta mchog ngang pa do	30.8325	90.67
Site 4	Just West of Ngang pa do	30.8419	90.655433
Site 5	Further West of Ngang pa do	30.842167	90.642333
Site 6	North of Khyi rgan gag pa do	30.842133	90.6252
Site 7	Lug do	30.801667	90.595
Site 8	Ra ma do	30.8	90.57
Site 9	Stong shong phug	30.839317	90.487217
Site 10	Se mo do/Srin mo do/Nang do	30.831667	90.391667
Site 11	Rigs lnga do	30.871667	90.38
Site 12	Lce do	30.813	90.273333
Site 13	Sha ba brag Thang stong phug	30.991667	89.675
Site 14	Kong chung	31.348233	89.204533
Site 15	Gnam g.yang phug	30.927083	89.090817
Site 16	Lha ris sgrub phug	30.975183	88.990533
Site 17	Slob dpon phug	31.582667	88.945167
Site 18	Sho lo phug	31.595333	88.8405
Site 19	Lha 'dre phug	31.61	88.826667
Site 20	Gzims phug btsan khang	31.420567	88.7227
Site 21	Dpal gzims phug	31.399	88.709333

Site No.	Site Name	North Latitude	East Longitude
Site 22	Rdo 'khor phug pa	31.377333	88.699867
Site 23	Dgon ro dmar lding/Lcags sgo brag	31.428	88.6525
Site 24	Lha 'dre tshogs khang	31.428167	88.6495
Site 25	Dar lung phug	31.4292	88.645383
Site 26*	Skyid sgrom sgo gru bzhi	31.423333	88.573333
Site 27	Sgar gsol brag phug	31.558667	88.565667
Site 28	Chu ro	31.379233	88.495267
Site 29	O rtsal phug	31.661733	88.4605
Site 30	Bshag bsangs	31.042133	87.613083
Site 31	Dar chung	31.297333	86.783
Site 32	Mgon bdag	31.321	86.7775
Site 33*	Am nag	31.329333	86.769333
Site 34	Rong thil rde'u lhas	33.052983	86.699417
Site 35	Sngon gdong	33.019883	86.672567
Site 36	Gyam gdong	32.996067	86.653517
Site 37	Rgya rug	32.975917	86.6509
Site 38	Brag khung mdzes po	31.761667	86.158333
Site 39	Mu ro ri (L1)	31.03534	85.63404
Site 40	Rta ri brag phug	33.006667	84.251667
Site 41	'Phrang lam	31.2062	84.039767
Site 42	Lha khang dmar chags	31.20995	84.02606
Site 43	Rdzong pi phi	30.113333	83.686667
Site 44	Ri rgyal	32.849983	83.104217
Site 45	Dkyil sgrum	32.531067	82.269783
Site 46	Bong lhas brag (near Skya bo klu khang)	31.858333	82.161667
Site 47	Ba'o lhas	33.831667	82.051667
Site 48	Phru gu dbyar ka	33.506667	81.876667
Site 49	Sngor gyam	33.18	81.826667
Site 50	Steng rtse mtshams khang	32.908333	81.4
Site 51	Brag lung nub ma	33.245	81.035
Site 52	Kham pa rwa co	33.261667	80.951667
Site 53	Gong ra/Gong kha	33.003333	80.519667
Site 54	Chu mkhar gyam	33.68	80.455
Site 55	Skabs ren spungs ri	32.973167	80.443833
Site 56	Tham ka can	30.967167	80.393
Site 57	Rta pa gong g.yag	33.681983	80.3845
Site 58	Ser mdzod rdo ring	33.058017	80.38325
Site 59	Mchod rten sbug sna kha	33.5557	80.330533
Site 60	Brag gdong East	33.104183	80.318333

Site No.	Site Name	North Latitude	East Longitude
Site 61	Glog phug mkhar	33.091	80.314167
Site 62	Brag gdong West	33.115	80.302667
Site 63	Gyam rag (East)	33.114933	80.254917
Site 64	Rtswa med god sa mon dur	33.117033	80.252033
Site 65	Rwa 'brog 'phrang	33.101667	80.251333
Site 66	Sgog ra	33.091667	80.246667
Site 67	Skal khra mon dur	33.118717	80.22465
Site 68	Sna kha sogs and Mtha' rung	33.110333	80.127167
Site 69	Mtha' kham pa ri	33.843833	80.061867
Site 70	Nag skyom	33.146133	80.05715
Site 71	Rgyab lung	33.771667	80.053333
Site 72	Brag gtsug	33.76055	80.030067
Site 73	Gna' bo lung	33.8705	80.028
Site 74	Chu lung	32.881667	79.936667
Site 75	Gyam kham pa	32.85125	79.923367
Site 76	Rdu ru can	31.56	79.913333
Site 77	Ri mo gdong	33.165	79.835
Site 78	Sa snying	31.6659	79.835667
Site 79	Rno ba g.yang rdo	33.633167	79.824333
Site 80	Nag khung rdo ring	33.141667	79.821667
Site 81	Gri'u chu thang	32.93	79.798333
Site 82	She rang sna kha shar ma	33.222317	79.786167
Site 83	Bri mo spo ba	31.72285	79.773417
Site 84	Rdzong chen	33.2575	79.741667
Site 85	She rang mkhar lung	33.1835	79.725333
Site 86	Rdzong chung	33.268667	79.7185
Site 87	Ru thog rdzong	33.416833	79.642
Site 88	Gser sgam	31.496667	79.631667
Site 89	Lu ring sna ka	33.401983	79.607617
Site 90	Mar lung	33.393333	79.588333
Site 91	Brag gyam	32.831667	79.585
Site 92	Rgyal la lding	31.616667	79.116667