COMING TO TERMS WITH THE FUTURE

Concepts of Resilience for the Study of Early Iranian Societies

REINHARD BERNBECK, GISELA EBERHARDT
& SUSAN POLLOCK (EDS)

THE IRANIAN HIGHLANDS EARLY SOCIETIES BETWEEN RESILIENCE AND INTEGRATION

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POLITICAL AND ECONOMIC INSTITUTIONS

Second-Year Cows for Manlari: Elamite State Investment in Cattle Husbandry in the Southern Zagros Mountains

Azam Rayat and Walther Sallaberger

Abstract

Some forty clay tablets inscribed in cuneiform from the site of Goshtāspi, Kohgiluye va Boyer-Ahmad province and dating to ca. 1100 BCE, attest to the Middle Elamite state administration in the southern Zagros mountains, between the capitals Anšan and Susa. Six tablets contain lists of cattle. They feature an excessively high number of second-year cows, which in no way reflects a natural composition of herds. Interestingly, royal investments in decentralized cattle husbandry, by sending young cows to a province, is not a unique historical phenomenon, but it can also be identified in the state of Ur in Lowland Mesopotamia (twenty-first century BCE). The textual evidence thus forces us to understand husbandry in the mountain regions and local economic developments in a larger frame of political history as well.

Keywords: Goshtāspi, Kohgiluye va Boyer-Ahmad; Middle Elamite kingdom; southern Zagros mountains; cattle husbandry in mountain region; second-year cows; local agriculture

چکیده

حدود چهل گِل نبشته از استقرارگاه گشتاسپی در استان گهگیلویه و بویر احمد کشف شده است. این محوطه میان پایتخت های عیلام –انشان و شوش– قرار دارد. قدمت گِل نبشته ها در حدود 1100 پ.م است و گواهی بر وجود یک بایگانی حکومتی از اواخر دورهٔ عیلام میانه در کوه های زاگرس جنوبی است. شش گِل نبشته حاوی فهرست گاو است. تعداد ماده گاوهای دوساله تا حدی زیاد است که به هیچ وجه نشانگر ترکیب طبیعی گله نیست. جالب توجه است که سرمایه گذاری های حکومتی در دامداری غیرمتمرکز به واسطه فرستادن ماده گاوهای جوان به یک منطقه، یک پدیدهٔ تاریخی بی مانند نیست. به عنوان مثال می توان نمونهٔ مشابهی را از دورهٔ اور 3 (سدهٔ 21 پ.م) در سرزمین های پست میانرودان نیز مشاهده کرد. بدین گونه شواهد متنی ما را به اجبار به مشاهده پرورش احشام در مناطق کوهستانی و تحولّات اقتصاد محلی در چهارچوب بزرگتری از تاریخ سیاسی در منطقهٔ غرب آسیا سوق می دهد.

کلید واژگان

کلید واژگان: گُشتاسپی؛ کهگیلویه و بویراحمد؛ پادشاهی عیلام میانه؛ منطقهٔ زاگرس جنوبی؛ پرورش گاو در منطقهٔ کوهستانی؛ ماده گاو دوساله؛ کشاورزی محلی.

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Fig. 1: The localization of Goshtāspi. © Mohammad T. Atayi.

The Elamite cattle lists from Goshtāspi, ancient Manlari by Azam Rayat

A group of Elamite administrative documents found at a small site near the 'Persian Gates' gives important insights into state management of livestock in regions away from the centers. Unexpectedly, animal husbandry in the Zagros mountains was thus not only a matter of 'private' pastoral nomads. From the perspective of the local herders, the investment of the state contributed to the economic resilience of this more marginal region. Before dealing with the relevant administrative texts in more detail, the findspot will be presented first.[1]

Discovery of the Goshtāspi tablets

In 2009, a MCTO agent confiscated 39 clay tablets and fragments with cuneiform inscriptions that were traded on the black market in Kohgiluye va Boyer-Ahmad province in southwestern Iran. Today, these clay tablets are kept in the museum of the provincial capital Yāsuj. The texts are written in Elamite, and they include administrative documents on small and large livestock and on grain, furthermore some letters; several tablets bear seal impressions. Formal and content-related similarities between the documents suggest that they may have originated from a single archive: the documents deal with related topics, expressions are repeated, more importantly, identical personal names and geographical names as well as identical seal impressions appear on different tablets.

Black-market traders mentioned Goshtāspi as the place of origin of these clay tablets. In December 2009, a team directed by Ahmad Azadi opened some trial trenches at

1 Although the authors have discussed the arguments brought forward in this article together, Azam Rayat is responsible for part 1, Walther Sallaberger for part 2.

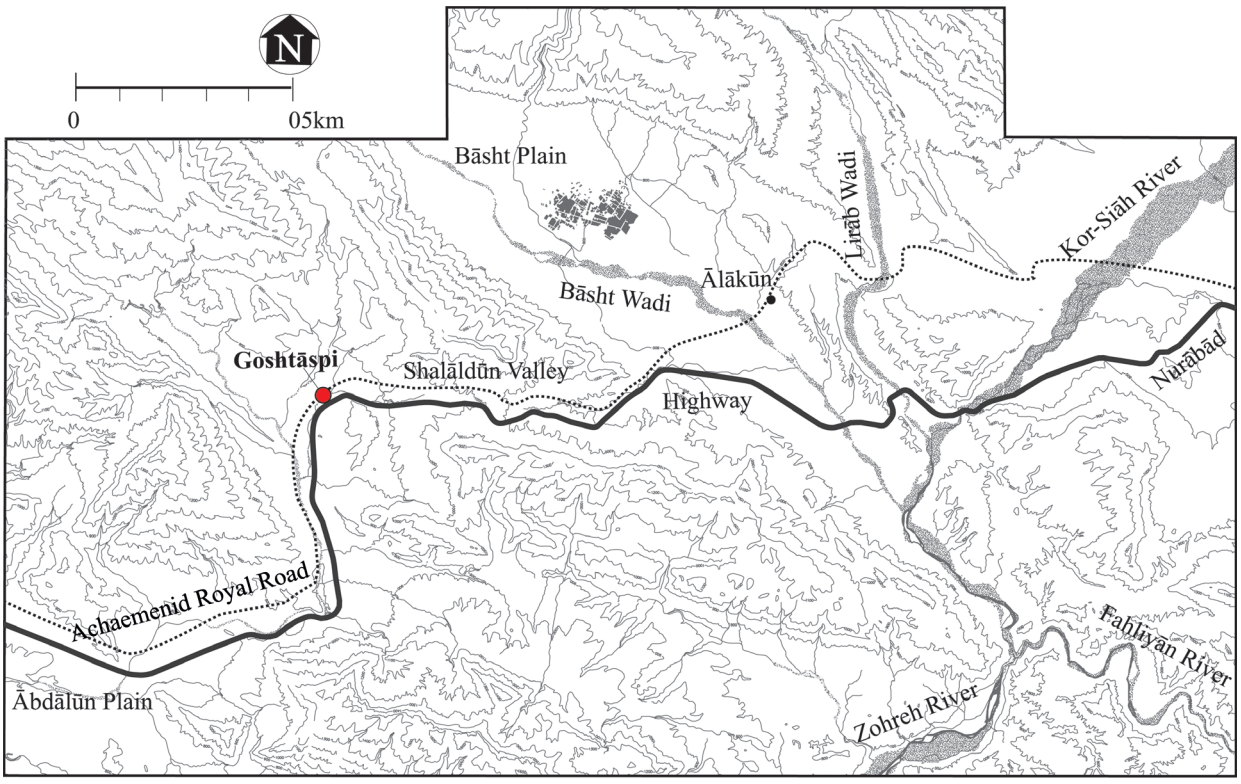

Fig. 2: Topographical map, with the location of Goshtāspi and the proposed course of the Achaemenid Royal Road (Persepolis – Susa). © Mohammad T. Atayi.

this site. Only a few sherds of Middle Elamite pottery were found, but no archaeological layers discovered. Therefore, the attribution of the clay tablets to this site was rejected first (Azadi 1388/2009). However, the origin of the clay tablets from Goshtāspi was confirmed by the discovery of another four clay tablets and a sealed clay bullae in the course of a survey in 2009 and a rescue excavation in 2017 (Yaghmaee *et al.* 1388/2010; Atayi 1396/2017a and 1396/2017b; and see below).

The site of Goshtāspi is located in the highlands of Iran in the southern part of the province of Kohgiluye va Boyer-Ahmad (Fig. 1), just northeast of the village of Goshtāspi in the small plain of Khan-Ahmad between the Bāsht plain to the northeast and Ābdālun Plain to the southwest, today an agricultural region. The remains of the archaeological site are situated close to the seasonal river and to local springs. Here, the old and the new main road from Babameydan to Gachsaran pass by, connecting the Iranian lowlands with the highlands. Also, the remains of an Achaemenid paved road were found in this area and an Achaemenid post station named Ālākūn was discovered to the east of Goshtāspi (Fig. 2; see Atayi *et al.* 1392/2012–2013, 61–73). This general situation indicates that Goshtāspi represented a settlement on the road between the centers in the Elamite state, between the Fars region around the capital Anšan (Tall-e Malyan) and the lowlands of Khuzistan with the second capital Susa.

The remains of the archaeological site of Goshtāspi were completely destroyed by the construction of the new road and by cultivation of the field between new and old road. Information on the find-spot was kindly provided in 2017 in a conversation by Mr. Mohammad Doshmanziari, the field owner and his father Gholam Hossein Pourasadi. He, a 80-year old man, remembered that the Goshtāspi area always looked as it did before the building of the new road, with a cultivated area at the slope of a rocky mound which had been terraced since ancient times. Such a setting is known from many sites in the region of the Gachsaran archaeological survey (Yaghmaee *et al.* 1386/2008; Yaghmaee *et al.* 1387/2009; Yaghmaee *et al.* 1388/2010; Yaghmaee *et al.* 1393/2015), where the feet of neighboring mounds and mountains were cultivated and terraced from the Early and Middle Islamic periods onwards. However, at our survey, no Islamic pottery was found, neither in the fields, nor in the soils removed in the course of construction work for the new road, and thus the region must have been used for agriculture, not for settlement in the Islamic period. In any case, segments of the Middle-Elamite settlement could already have been destroyed in the three millennia before the new road was built.

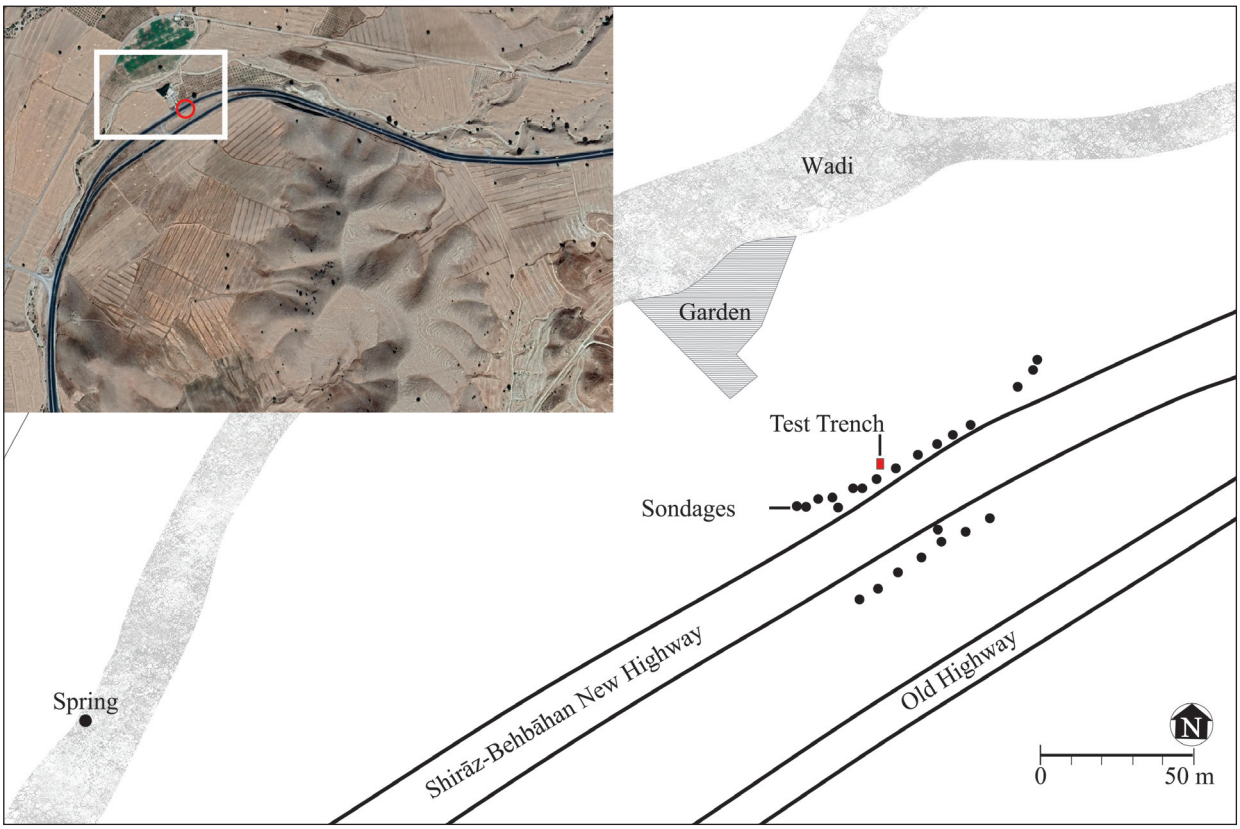

Fig. 3: Position of test trench and sondages. © Mohammad T. Atayi 2017, adapted by Azam Rayat.

The Doshmanziari family used this area for dry farming until April 2009, when an individual from Yāsuj started ploughing the land where the Goshtāspi mound was located. Thereby he reportedly found a few sherds of pottery and a fragment of a clay tablet, and he rented the land. He worked the field for three months claiming to cultivate watermelons, but was mainly engaged in illegal excavations. Mr. Doshmanziari was informed about the case after three months when his field lessee was arrested. The tablets were confiscated and brought to the museum of Yāsuj.

In the following year (2010), Mr. Doshmanziari found more pottery fragments and three clay tablets in the same area of the field where before illegal diggings had been performed and artefacts were discovered. The objects included eleven broken bowls, two with 'stump base' (or 'button base'). With the donation of Doshmanziari's pieces to the museum, the site of Goshtāspi was proven as the provenience of the confiscated tablets in the Yāsuj Museum.[2]

This was confirmed by a team directed by M. T. Atayi in 2017 (see Atayi 1396/2017a and 1306/2017b) when they investigated the piles of earth that were removed from the area of the original findspot in the course of the road construction. Sifting of the material led to the discovery of more Middle Elamite pottery and a clay bulla with an impression similar to impressions on the tablets in the Yāsuj Museum with the same technique of granulation.

Mr. Doshmanziari and his father were absolutely certain about the precise location where the tablets and the pottery had been found. The findspot lay exactly where the new road had been constructed (see Fig. 2). Therefore, the archaeological team of Mohammad Taqi Atayi, Azam Rayat and Yunes Zare, started their 2017 excavations as close as possible to this location in order to identify possible remains and to detect the possible extent of the Middle Elamite settlement of Goshtāspi. A test trench of 3 × 2 m and 40 cm depth was made at a place of an accumulation of pottery sherds directly north of the new highway, directed towards the river (N30 19.461 E51 05.913 39; R 509473 3354732). The sounding passed through virgin soil, and was not rewarded by any archaeological finds, and similarly a further twenty sondages at both sides of the new highway (Fig. 3) did not reveal any archaeological layers. Therefore, after the terracing of the area perhaps in

2 Gian Pietro Basello informed us (personal communication April 2021) that he had a look at the tablets in 2014, identifying the language and considering them in a preliminary way similar to the administrative tablets from Tall-e Malyan.

the Early or Middle Islamic period, the constant cultivation, the looting and finally the large-scale destruction by the modern road, no remains of the original site are preserved *in situ* any more, and thus the form and even the extent of the settlement where the tablets come from must remain unknown. All that was left, were heaps of soil placed in the neighboring field for their use in agriculture. This earth stemmed from the place where the new highway was built. By sieving the soil, more than 2,800 pottery sherds were discovered, 80% of which are pieces from storage vessels with plastic decorations. Since the soil came from the place of the new road, the remains of the settlement may not have extended further than 20 or 30 meters in diameter.

The cuneiform tablets found at Goshtāspi were written in the Elamite language, as clearly shown by some phonographically written words, although the texts included numerous Akkadograms and Sumerograms especially in the lists of cattle and grain. Together with an unpublished group of texts from Tall-e Malyan (complementing the texts on metals edited by Stolper 1984), they are the only sources on subsistence economy from the late Middle Elamite period. Also, the personal names in the Goshtāspi tablets are Elamite, which can be set in contrast to the Old Babylonian traditions of the lowlands of Iran where many Akkadian names are included as well (e.g., Zadok 1991, 226). Texts are dated by month and day, but not by years, so that it is not possible to determine the duration of the archive. However, the uniform appearance of the texts and the prosopographic interrelations indicate that it may stem from a very short period of a few years only.

An exact dating of the corpus can be based on paleographic and linguistic criteria. For paleographic reasons, an Achaemenid dating is out of the question; in fact, the texts seem to be even older than the administrative texts of the Neo-Elamite period from Susa. However, the administrative texts from Middle Elamite Haft Tappeh use older sign forms than the texts discussed here. Regarding paleography and orthography, the Goshtāspi corpus corresponds very well to the administrative documents from Tall-e Malyan (Rayat 2017). Furthermore, the Elamite word *puphin* for the male adult cattle has so far only been documented in (hitherto unpublished) texts from Malyan (Hinz and Koch 1987, 241).

The dating parallel to late Middle Elamite Malyan corresponds to the archaeological evidence of the pottery and it is confirmed by the style of the seal impressions. The sherds from the storage vessels with plastic decorations as well as the typical 'stump based' pottery date probably to the Middle Elamite period (Atayi 1396/2017a and 1396/2017b). The impressions on the Goshtāspi tablets, stemming probably from silver bracelets, can best be compared to similar ones from Tall-e Malyan. Both not only show the same technique of granulation, but even contain an almost identical pattern with repeating rosettes (Stolper 1984, 17–18 and fig. 6).

In conclusion, the texts can be considered contemporary to the late Middle Elamite texts from Malyan, thus dating most probably to the time of or after king Hutelutush-Inshushinak, ca. 1100 or eleventh century BCE, the last years of a Middle Elamite kingdom (Stolper 1984, 9). Although subsequently, no textual sources are known up to the second half of the eighth century, and thus a later dating could not be excluded, the basic fact that administrative texts were found here presupposes the existence of a state in whose realm administrative texts were written. A dating to the last important king of Elam around 1100 BCE, Hutelutush-Inshushinak or one of his direct successors, is therefore unavoidable. The texts thus belong probably to the period of the short revival of the Middle Elamite state under Hutelutush-Inshushinak, a ruler who apparently concentrated his efforts in state-building on Elam itself, after the previous interests of Elamite kings directed towards Mesopotamia had ended shortly before with the victories of Nebukadnezar I of Babylon (1125–1104 BCE). Hutelutush-Inshushinak, however, lived in a turbulent period, the Early Iron Age, and after his reign, no textual nor archaeological sources concerning an Elamite kingdom are known for fully three centuries, until the eighth century.

Lists of cattle

This contribution concentrates on the administrative texts from Goshtāspi concerning cattle. Cattle were kept in herds on pasture and the corresponding grassland exists where sufficient water was available. Goshtāspi is situated at about 960 meters above sea level in the highlands of the Zagros mountains, in the transition zone to the lowlands. The Bāsht Plain, in which Goshtāspi is located, measures 800 km^2. Further plains border to the east and west, the Rostam-do Plain in the east, and the Emamzadeh Jafar Plain or Dogonbadān in the west; the Lallar Mountains to the north and the Shilaldun Mountains to the south confine this area. The region receives sufficient rainfall in winter and spring, on average about 400 mm per year. Winters are mild with rare frosts and summers are warm without being very hot, in contrast to the Marvdasht plain east of Malyan with cold winters and less rainfall in summer. The north is mountainous and cold, while the south is warm (station Emamzadeh Jafar west of Goshtaspi, see Kortum 1976, 18). Throughout the seasons, different areas can be used for agriculture. The plain is especially suited for agriculture, it features several water sources and qanats and a permanent river. The rainfall allows cultivation without artificial irrigation. Thus, the Bāsht plain and the neighboring plains offer the geographical and climatic characteristics suitable for the keeping of small and large livestock.

obv.	[*pu-up-hi*]-ʳ*in*ˀᴹᴱŠ RE-MU-UMᴹᴱŠ MU 2ᴹᴱŠ MUNUS MU 2ᴹᴱŠ tu_4-*la*ᴹᴱŠ MUNUS ʳtu_4ˀ-[*la*ᴹᴱŠ]						
	[20]+4	23	33	1 ME 1,20			*ki-te-u*
	[10]+ʳ4ˀ	18	11	1 ME 19		4	ᴬᴺ*ši-du-ak-sir*
	[ ]+ʳ6ˀ	6	3	44		1	*ki-te-te*
5	[ ]	4	4	40		2	*ak-ši-ši*
	[ ]	5	7	1,12		1	*te-ip-du-du*
	[PAP] ʳ53ˀ	57	58	ʳ4ˀ ME 55		8	GUDᴹᴱŠ ŠA 5 E2.TUŠᴹᴱŠ
lo.e	ʳx-x-x PIˀ+PIR$_2$ ᵈᵀᴵŠ*ki-te-u*						
rev.	[x x x x x] ʳxˀ [x x]-*ri*						

Translation:							
obv.	[o]x, cow, second-year (bull), second-year female (cow), calf (male), female calf						
	[2]4	23	33	180			Kiteu
	[1]4	18	11	119		4	Šidu-aksir
	[ ]6	6	3	44		1	Kitete
5	[...]	4	4	40		2	Akšiši
	[...]	5	7	72		1	Tep-dudu
	[total:] 53	57	58	455		8	cattle of 5 *locations*
lo.e.	... inspection(?) by Kiteu						
rev.	...						

Tab. 1: The cattle list G.5 from Goshtāspi (southern Zagros mountains, ca. 1100 BCE). Yāsuj Museum, Kohgiluye va Boyer-Ahmad; dimensions: 48×83×13 mm; seal impressions on upper edge and right edge; obverse, lower and right edge well preserved, reverse damaged, left edge broken off.

The pasture area needed for the cattle attested in the lists can only be estimated. According to this author's personal observation, up to five hectares are calculated for one cattle in the Marvdasht plain in the neighboring province Fars. So, the about 650 heads of cattle mentioned in the texts must have occupied a minimum area of 32.5 km^2. Cattle find their fodder mainly in the weeds of the fields and in reeds. Since one should include also space for agriculture, settlements and the sheep flocks, the region for the cattle husbandry must have been considerably larger. This leads already to an important conclusion: the animals documented by the Elamite lists found at Goshtāspi were not kept just around a very small settlement of a few houses, but in a wider region, a region covered by the state administration that issued the tablets. A tablet includes a list of almost one hundred men, women, and children, but this relatively low number does not allow to estimate the personnel subject to the state administration or the population of Manlari and its region.

Six clay tablets and fragments list large livestock in the following way (not always in the same order):

- Tabular tablets in 'landscape' format group the large livestock according to age and sex, with the numbers given for the respective category in relation to a personal name; the personal names thus stand for the responsibles or herdsmen who were in charge of the numbered cattle herd. The last line of the table gives the total (PAP) of each category. In the example G.5[3] (Tab. 1) the total sums up to 631 heads of cattle (calculated, not given in the text).
- A subscript names an individual, perhaps as "inspector" (the reading and meaning of the logogram "PI+PÍR" is uncertain); an individual in charge of the accounting process (Akkadian *nikkassa īpuš* "he made the accounting"); month name; the place name *Manlari*; and a seal impression.

The persons listed by name are those responsible for the herds of cattle. The tablet G.5 presented here shows five herds of cattle, each with one person. In the final clause, usually the first phrase concerns the inspection, the second the accounting and the respective persons in charge.

The month-names perhaps point to the period around the end of a year and the beginning of the following one as time for accounting (based on the preliminary study of Rayat 2017). Thus G.36 of this tabular format dates to a month *Zarpaku*, perhaps the second month, whereas a different type of list of cattle dates to *Addarimma*, possibly the 12th month (G.11), as does a small fragment which perhaps contained a list of cattle (G.20).

The city mentioned in the Goshtāspi texts is called *Manlari*, a hitherto unknown place name. Therefore, the

3 Note that the numbering of the clay tablets from Goshtāspi (G.) is provisional.

Composition of herds in G.5:

	[bull]	ox	cow	second- year (male)	second-year female	(male) calf	female calf
[PUḪĀLU]		*puphin*	RĒMUM	MU 2	MUNUS MU 2	*tula*	MUNUS *tula*
Kiteu	[...]	[2]4	23	33	180		
Šidu-aksir	[...]	[1]4	18	11	119		4
Kitete	[...]	6	6	3	44		1
Akšiši	[...]	[...]	4	4	40		2
Tep-dudu	[...]	[...]	5	7	72		1

Composition of herds in G.36:

	[bull]	[ox]	cow	second-year (male)	second-year female	(male) calf	female calf
	[PUḪĀLU]	[*puphin*]	RĒMUM	MU 2	MUNUS MU 2	*tula*	MUNUS *tula*
Kiteu	[...]	[...]	[...]	47	⌜189⌝		
Šidu-aksir	[...]	[...]	11	11	120	1	
Kitete	[...]	[...]	5	5	36		
Akšiši	[...]	[...]	[...]	3	23		
Tep-dudu	[...]	[...]	6	5	58	1	
Hahi	[...]	[...]	4	6	50		

Tab. 2: The composition of cattle herds in G.5 and G.36 from Goshtāspi (southern Zagros mountains, ca. 1100 BCE).

	bull	**ox**	**cow**	**second-year (male)**	**second-year female**	**(male) calf**	**female calf**
	PUḪĀLU	*puphin*	RĒMUM	MU 2	MUNUS MU 2	*tula*	MUNUS *tula*
G.5	[...]?	53	57	58	455	0	8
G.36	[...]?	[...]	⌜48⌝	⌜77⌝	476	2	0
G.28	37	47	263+	[...]	[...]	[...]	[...]

	bull	**ox**	**cow**	**second--year (male)**	**second-year female**	**(male) calf**	**female calf**
	PUḪĀLU	*puphin*	RĒMUM	MU 2	MUNUS MU 2	*tula*	MUNUS *tula*
G.5	[...]?	8%	9%	9%	**72%**	0%	1%
G.36	[...]?	[...]	8%	13%	**79%**	0.3%	0%
G.28	11%	14%	**76% +**	[...]	[...]	[...]	[...]

Tab. 3: Totals of herds in G.5, G.36, and G.28 from Goshtāspi (southern Zagros mountains, ca. 1100 BCE). Above: numbers. Below: percentages (of preserved numbers only).

conclusion is inevitable that *Manlari* was the ancient name of the settlement that once occupied the site of Goshtāspi.

The numbers for the various cattle categories inform us about the composition of the single herds (Tab. 2).

The first observation concerns the distribution of male and female cattle and the terminology. As can easily be seen from Tab. 2, the ratio of male (*puphin*) to female adults (*RE-MU-UM*^{MEŠ}) is almost exactly 1:1. Therefore, the term *puphin* cannot represent the bull, since much less breeding bulls were needed for breeding. In modern husbandry, one bull is sufficient for 60–70 cows in stables and 30–40 cows in pastures, and the latter ratio is considered for the Old Babylonian period (Kraus 1966, 44). The male animals designated with the Elamite word *puphin* can thus be identified as oxen.

At least the fragmentary text G.28 lists *PUḪĀLU*, "breeding bulls", and here the ratio between bulls and cows is 1:7 (Tab. 3). Very similar ratios of 1:8 (G.5) and 1:6 (G.36) are given for the second-year animals (Tab. 3; see on this data the section on meat production p. 176–77 below). Therefore, a higher number of breeding bulls than thought necessary nowadays was kept with the cattle herds in the Zagros mountains. Furthermore, the constant ratio of male to female animals both for adults and second-year animals indicates that the latter were intended for breeding. Closer to the composition of the Goshtāspi lists is the herd documented in a Middle Assyrian tablet dating to the reign of Tukulti-Ninurta I (1233–1197 BCE), with 127 heads of cattle and a ratio of male (GUD) to female animals (AB_2) of about 1:1 (Deller and Tsukimoto 1985, 325; including cattle of 3 years and more). The ratio of male to female adults

corresponds mostly to 1:1 to 1:2 in the Middle-Assyrian cattle herds at Tall Sheikh Hamad in Upper Mesopotamia (Röllig 2008, 13).

Returning to the Goshtāspi lists, one notes that the distribution of animals among the categories is uneven, as the percentages indicate (Tab. 3): the percentages were indicated for the preserved parts of the texts only, and therefore reliable numbers for the composition of a herd can only be reached for G.5. The most prominent feature in G.5 and G.36 is the high number of second-year cattle, especially female yearlings, with more than 70% of the total number of animals. We will discuss this aspect from different perspectives.

The administrators

In the Goshtāspi texts about large cattle, two individuals appear in an administrative capacity, who cooperate with each other. The "inspection" (?) (PI+PIR2) (Stolper 1984, 11) of cattle was the responsibility of a man named Kiteu, who confirmed his role by impressing his bracelet as sealing. Furthermore, he may be identified with the person named Kiteu who appears with the largest number of livestock at top of the preserved lists. The large number demonstrates well the extent of his responsibilities (Kraus 1966, 164). Kiteu was probably a person from the local milieu, since he pastured cattle as the others, but as controller, he was at the same time a man in the service of the monitoring institution, namely the state.

The other important man was Kiteri, responsible for the accounting (Akkadographic *NIKKASSU ĪPUŠ*) of the cattle herds. Apparently, he received his instructions from an external organization, since he is mentioned as the addressee in letters from the same archive. As a manager in the name of the state, he seems to have controlled the whole administration at Goshtāspi. As an individual he thus personifies how the local administration of cattle was integrated into the larger network of the Elamite state. The latter's center was Anshan, located in the highlands of Fars. This connection may be confirmed by another letter from Goshtāspi, where the place name "Anshan" (AŠ$^{\Gamma}$*an*^{1}-*za-an*) is mentioned in relation to large livestock (GUD).

Meat production and the fate of the male yearlings

As well documented in Mesopotamian sources, cattle was kept in order to provide dairy products and meat for meals, for example including envoys, or for sacrifices in temples, and for leather. Adults, both oxen and cows, are used as draught animals for ploughs and wagons (Weszeli 2006–2008, 388). The cattle herds of Manlari may have been kept for the same purposes in the Bāsht plain with its well-suited conditions for animal breeding.

Archeozoological investigations at Tall-e Malyan, the Elamite capital of Anshan, provide material evidence for one of these purposes exactly for the period in question, the Qaleh period (1600–1000 BCE). This evidence stems from "Operation EDD," situated near the highest part of the mound at Malyan where precisely the Middle-Elamite archive was found that provides the best comparison to the Goshtāspi texts (see above), including references to cattle (Carter and Stolper 1984, 42; Stolper 1984, 1 with fig.1; Stolper 1984, no. 46:6 GUD^{MEŠ}). Analyzing the animal bones from this excavation area, Zeder (1988) observed higher percentages of cattle in all Qaleh period deposits and interpreted this as an increase in the overall availability of cattle for consumption; at this period, cattle bones contribute over 40% of the total identifiable bone weight (Zeder 1988, 44 and tab. 4). Zeder (1988, 45 and tab. 11) argues that the high 64% percentage of limb elements in the large mammal sample from Operation EDD points to a local consumption of beef rather than disbursement. Both the fusion of the long bones and the patterns of tooth eruption allowed Zeder to determine that the slaughtered cattle found in EDD were unusually young. The age curve of the long bones shows an intensive selection of animals at ca. 18 months of age and after a gap, a further concentration on animals of ca. 30 months of age. So the pattern in the EDD assemblage is peculiar not only for the extraordinarily high proportion of cattle, but also for the young age of the selected cattle (Zeder 1988, 47).

Tall-e Malyan, ancient Anshan, is known as the capital of the Elamite kingdom, and therefore the high consumption of young cattle in the center of the city, in operation EDD, can be understood as remains of elite consumption in a period of economic wealth. Furthermore, the increase of beef consumption might also be related to a shift in population. At Malyan, two different pottery wares, one with local criteria and the other related to the capitals in the lowlands of Khuzestan, were interpreted as indicating two different groups of residents. In this context, Zeder (1988, 47) interprets the rearing of cattle specifically for the consumption of younger, certainly finer animals as a strategy to support the elites from the lowlands.

This data allows us to see the Goshtāspi evidence in a wider perspective. Evidently, the high proportion of second-year cattle in the Elamite lists can only depend on an import of additional cows but not stem from natural procreation of the herds of cattle (see in more detail the second part of this study). The only imaginable actor for the import of animals can be the Elamite state. Furthermore, the proportion of male to female yearlings in the written documentation of the herds does not represent a natural reproduction rate which should be around 1:1 for male to female animals. In the texts, however, we find 58 male (11%) against 455 female yearlings in G.5 (ratio 1 : 8); and 77 male (14%) against 476 female animals in G. 36 (ratio 1:6; see above with Tab. 3). Therefore, ca. 85% to almost 90% of young male cattle was selected for other

use than breeding in the provinces. The evidence of the animal's bones from Operation EDD in Malyan suggests that many of these male animals ended up as food for the feasts there. The surplus from a successful husbandry in the state allowed abundant meat consumption in the capital.

Manlari in the network of the Elamite state

The Goshtāspi tablets represent the first Middle-Elamite archive that does not originate from one of the great royal centers, such as Susa or Anshan (Tall-e Malyan), but from the crucial transit area in the southern Zagros mountains, connecting the highlands with the lowlands of Iran. The texts found in Goshtāspi suggest that the site was part of a larger administrative network and they thus provide an insight into the economic, social, and institutional structures of the Elamite state.

The pure existence of administrative lists from Goshtāspi proves that livestock farming in this area was integrated into a larger administrative system. The sealed objects also point to supraregional administrative procedures and external contacts. The seal impressions belonging to different officials in different localities, namely in Anshan and Manlari, are of the same type and thus underline the coherence of the large administrative organization. The Achaemenid royal road near the site with its post station Ālākun nearby indicate the significant role of the region in connecting the centers of Elam.

Not only the functioning of overland communication along the road passing by Goshtāspi, including the exchange of messengers, merchants and traders or armies, depends heavily on the availability of resources. The cattle herds could have served the supply of a station on this road. But beyond that, the large number of cattle suggests that livestock was probably a main product of the regional economy. Does it imply that various regions in the state of Elam were used differently, that different natural resources were exploited, in order to redistribute the agricultural products according to needs in different parts of the state? Perhaps the relationship between Anshan in Fars and Manlari in the Bāsht plain finds a kind of later parallel in the Achaemenid economy of Persepolis, which had Fahlian, the western part of Fars, under its economic control (Henkelman 2008, 118–9).

Although the archeozoological evidence from operation EDD in Tall-e Malyan discussed above already indicates that cattle was sent to the capital from rural regions, one can additionally point to the possibly parallel case of caprids as interpreted by Zeder (1988). According to her understanding of the archeozoological data, traveler shepherds came through to exchange animal products and perhaps trade goods with the Elamite administrators of Tall-e Malyan in the EDD building as entrepot (Zeder 1988, 46).

Agricultural production and cattle breeding based on the ideal environmental conditions of a region, led to an employment of personnel and workers there. They were supported by the larger administrative network of the state, as the distribution of cattle herds among the inhabitants of Manlari has shown. Therefore, their strategies for crisis management did not stop with the traditional storage of grain (Halstead and O'Shea 1989), well attested with the find of storage vessels in Goshtāspi. But the texts open a wider perspective and allow us to understand, how local herdsmen made their living within the Elamite state. Instead of the nomadic or semi-nomadic herdsmen organized in kinships and tribes which scholarship usually assumes for the Zagros mountains, the herdsmen of Goshtāspi were well integrated in the economic organization of the Middle Elamite kingdom. A state offered the local communities a security against outer enemies and against criminals, and this had intensive effects on the existence, growth and wealth of local settlements in regions even as distant from the centers as the Bāsht plain. A crisis of the state administration, however, may therefore have well effected the distant local communities as well.

Transfers of second-year cows in Iran and Mesopotamia: Documents from Early Iron Age Goshtāspi and from the state administration of the Third Dynasty of Ur by Walther Sallaberger

The terminology of cattle in cuneiform documents reflects their life-cycle, and the terminology in the Goshtāspi tablets as elucidated by Rayat (2017) agrees with that. The Goshtāspi documents start with the adult and end with the young animals, as it is usually the case. Contrary to documents on cattle breeding from other regions,[4] male animals are listed before the female ones. The stage between the calves and the adult cows is reflected by only one category, the "second-year" cattle, whereas Mesopotamian documents usually differentiate animals in their first, second, and third year (Stol 1995, 174–77). The "second-year" cow in the Goshtāspi documents reflects the stage of a young cow, a heifer, after weaning and before her first calving which may be assumed around the age of two or two-and-a-half years. Second-year cows have become strong enough to be transferred over larger distances, and at their place of destination they can stay

4 In documents from Early to Late Bronze Age Mesopotamia, namely Ur III (twenty-first century BCE), Old Babylonian (nineteenth to seventeenth centuries, Stol 1995, 180–83); Middle Assyrian (thirteenth century, Röllig 2008, 10–11), female animals are counted before the male ones in texts concerning breeding; with animals for slaughter, male animals are listed first.

adult male	adult female	third-year male	third-year female	second-year male	second-year female	first-year male	first-year female
107	152	69	45	18	116*	20	15
20%	28%	13%	8%	3%	22%	4%	3%

Tab. 4: Age and sex distribution of cattle handled by the state administration during one year: the totals (Babylonia, Ur III period, twenty-first century BCE). Account of Lugalmelam, main official for cattle in Puzriš-Dagān. JCS 14 114 22 (dated Šu-Suen year 4). * = including 4 grain-fed second-year cows.

breeding bull	adult male	adult female	third-year male	third-year female	second-year male	second-year female	first-year male
gud ĝeš-du$_3$	gud	ab$_2$ maḫ$_2$	ab$_2$ mu 3	ab$_2$ mu 2	ab$_2$ mu 1	gud mu 2	**gud mu 1**
4	1	1	1	17	15	4	**20**
3%	1%	1%	1%	13%	8%	3%	**16%**

Tab. 5: Age and sex distribution of cattle kept by the royal cowherds within the transfers summarized in Tab. 4. Account of Lugalmelam, main official for cattle in Puzriš-Dagān, JCS 14 114 22 r.ii 4-27 (ii 4 read 1 gud) (dated Šu-Suen year 4).

for a maximally long period of breeding, starting with their first calves directly after arrival.

As pointed out by Azam Rayat in the first part of this contribution (see Tab. 3), the Middle Elamite lists of cattle from Goshtāspi document an extraordinarily high proportion of second-year cows in the documented herds. Such a sex-age-distribution of cattle can never be reached by natural development of herds of cattle. This is indicated, first, by the low number of male animals of the same age (see above), but more importantly, the low number of adult cows in the same animal herds never allows for so many second-year cows. From a herd with 48 (G.36) or 57 (G.5) cows one expects the same number of calves every second year, thus 24 or 28 calves per year, that is 12 or 14 female calves. Even if the designation as "second-year cow" would have included a life-span of more than a year, but the period of a heifer, the cows may have produced perhaps 25 heifers, but never the 476 or 455 animals listed in the documents (Tab. 3a).

More than four hundred young cows and a good 50, 60 young bulls arrived at Manlari, a station in the Zagros Mountains near the Persian Gates, within a very short period of time and were distributed among six local herds. In this case, we may not assume that roaming herds or other complete herds were taken over, but rather that the animals most fitting for breeding were selected and transferred to the Bāsht plain. The only possible sender was the state administration or the royal palace, since this was the only imaginable agent who disposed of the means to select about 450 young cows from its holdings and could have been interested in transfers within larger regions. With an assumed birth-rate of a calf every second year and an equal distribution of male and female calves, 450 heifers were born by not less than 1800 cows. It is pointless to speculate whether the palace made the selection in a favourable year from its own herds, rescued herds from endangered areas or passed on some of the spoils of war. In any case, it is clear that this was a one-off investment: G.5 and G.36 have roughly equal numbers of second-year cows in an otherwise comparable context; in G.28 the peak has arrived at the adult cows (see above Tab. 3 and below Tab. 8). And as discussed by Azam Rayat above, archeozoological evidence (Zeder 1988) suggests that a larger part of the young bulls was selected for meat consumption in the capital.

The numbers for cattle in the Goshtāspi lists thus make already perfect sense if one considers the find-spot, the historical situation and what is known about the life-cycle of cows. With the Goshtāspi evidence in mind, it has become even possible to discover a parallel case of state investment in cattle herds which had remained unknown before. This parallel comes from a completely different period and a different environment, but again young cows are transferred in a royal administration to the benefit of regional holders of herds. Such transfers are attested within the most massive data on transactions of animals known from the cuneiform world, namely in the documentation of the central management for the royal holdings of cattle and sheep in the state of the kings of Ur stationed at Puzriš-Dagān, dating to the twenty-first century BCE. In its heyday, this administration handled 60,000 to 80,000 animals per year (Sallaberger 1999, 261). Both cattle and sheep, and mostly male animals, were selected for slaughter for meals of the army, of messengers or the court, or for sacrifices in the temples. The larger part was held in herds in the land. Regularly, the royal herds incorporated various deliveries from the royal holdings, from the provinces both in the alluvial plain and in the periphery, or from booty. Cattle herds included slightly more male than female animals, since oxen were used as draught animals

Tab. 6: Transfer of cattle to city-rulers from the state within the transfers summarized in Tab. 4 (Babylonia, Ur III period, twenty-first century BCE).

second-year female, grain-fed	second-year male	second-year female	female donkeys	
ab_2 mu 2 niga	gud mu 2	ab_2 mu 2	$dusu_2$ munus	
4	3	13	1	governor of Irisaĝrig, month 1
	5	16		governor of Sippar, month 4
	1	2		governor of Ešnunna, month 8
	1	14	1	governor of Adab, month 9
	2	5		governor of Isin, month 12
	2	14		governor of Šuruppag, month 7
Total: 4	**14**	**64**	**2**	**= 82 cattle to the city governors for their term of duty**
5%	**17%**	**78%**		

Tab. 7: Transfer of cattle to city-rulers from the state in another document (Babylonia, Ur III period, twenty-first century BCE). Account of Enlila, main official for cattle in Puzriš-Dagān, SET 068 (dated Šu-Suen year 2). NB: Contrary to the evidence shown in Tab. 5, in this case only 7 cattle was distributed to the royal cowherds, including 5 (!) oxen.

second-year male	second-year female	
gud mu 2	ab_2 mu 2	
1	11	governor of Sippar, month 7
	22	governor of Šuruppag, month 9
	2	governor of Adab, month 6
total: 1	**35**	**= 36 cattle to the city governors for their term of duty**

especially in agriculture. Around three quarters of the herds were made up of adult animals, the last quarter consisting of first-, second- and third-year animals; this reflects a medium bovine lifetime of twelve years.

An annual account (JCS 14 114 22)[5] for the redistribution of cattle, those remaining after those for slaughter were deducted shows an even sex and age distribution. Lugalmelam, the state manager for cattle, delivered 542 cattle (+ 2 donkeys) from the incoming animals, and their age and sex distribution is shown in Tab. 4. They are distributed for various expenditures, and a good part is destinated for plough-work in the cities, represented by the temple administrators who were mainly in charge of agricultural production.

Within the redistributed animals, second-year cows appear with a remarkably high percentage. Where did they go to? Interestingly, the crown's own herds profited only partly from them. One quarter of the total cattle (126 cattle) was given to the "cowherds" (unu_3) (Tab. 5).

The second-year cows went largely to the city-rulers of various cities, and explicitly for their term of duty (bala; see Tab. 6). This 'term of duty' determined contributions to the state by the provinces by delivering goods, but mainly by running some state organizations with their personnel and their resources (Sharlach 2004). The provinces thereby contributed their share to the state functions, mainly to support the army or the networks of messengers. As an economic exchange for this service, the crown sent second-year cows in high numbers, as evidenced by the texts shown in Tables 6 and 7 and some other documents.

Furthermore, a certain geographical distribution in the cities of Tables 6 and 7 can be observed: the provinces are those north of Adab, including Irisaĝrig (to the east of Nippur), Isin, and Šuruppag in middle Babylonia, Sippar in northern Babylonia, Ešnuna in the Diyala region, and, according to another document, other provinces of northern Babylonia such as Marad, Pus, or Babilim; in the south, Uruk is named only once. Girsu, the largest province in the south, received sheep instead (BDTNS 059290 = MFM 2 14 01, annual account of the year Šu-Suen 6).

The example may be distant in time and region, but it gives an excellent idea about economic investments of the crown in societies with a comparable technological background. In both cases, in the state of Ur in Mesopotamia at the end of the Early Bronze Age, and in the Middle Elamite State at the beginning of the Iron Age, the crown administration sent large groups of second-year cows from the centre to provinces or regional centres. This allowed breeding of herds of cattle at those places in the state that seemed appropriate for cattle breeding and that should be supported economically.

The crown concentrated its economic income on a few agricultural sectors, of which cattle husbandry always played an important role. For the crown, the decentralized herding of its cattle minimized the danger of larger losses, by environmental catastrophes, by animal diseases or by hostile attacks. Furthermore, the cowherds kept the

5 The references to cuneiform documents from the Ur III periods are those used by the *Database of Neo-Sumerian Texts (BDTNS)* established by Manuel Molina (http://bdtns.filol.csic.es/, accessed February 10, 2023.).

Step 1: Development from G.5 to G.36								
Person in charge of cattle	**breeding bulls**	**oxen**	**cows**	**second-year males**	**second-year females**	**male calves**	**female calves**	*total* G.5 ⟶ G.36
Kiteu	[...]?	24 ⟶ x	23 ⟶ x [-5?]	33 ⟶ 47 +14	180 ⟶ 189 +9	0 ⟶ 0	0 ⟶ 0	*261 ⟶ c.270*
Šiduaksir	[...]?	14 ⟶ x	18 ⟶ 11 -7	11 ⟶ 11	119 ⟶ 120 +1	0 ⟶ 1	4 ⟶ 0 -4	*177 ⟶ c. 170*
Kitete	[...]?	16 ⟶ x	6 ⟶ 5 -1	3 ⟶ 5 +2	44 ⟶ 36 -8	0 ⟶ 0	1 ⟶ 0 -1	*70 ⟶ c. 65*
Akšiši	[...]?	x ⟶ x	4 ⟶ x [-1?]	4 ⟶ 3 -1	40 ⟶ 23 -17	0 ⟶ 0	2 ⟶ 0 -2	*50+x ⟶ 26+x*
Tepdudu	[...]?	x ⟶ x	5 ⟶ 6 +1	7 ⟶ 5 -2	72 ⟶ 58 -14	0 ⟶ 1	1 ⟶ 0 -1	*85+x ⟶ 69+x*
+ Ḫaḫi	[...]?	0⟶ x +x	0 ⟶ 4 +4	0 ⟶ 6 +6	0 ⟶ 50 +50	0 ⟶ 0	0 ⟶ 0	*0 ⟶ 60+x*
Totals	[...]?	*53 ⟶ x*	*57 ⟶ 48 - 9*	*58 ⟶ 77 +19*	*455 ⟶ 476 +22*	*0 ⟶ 2*	*8 ⟶ 0 -8*	*631⟶ 603+x*

Step 2: Development from G.5 → G.36 to G.28 (totals)							
	breeding bulls	**oxen**	**cows**	**second-year male**	**second-year female**	**male calves**	**female calves**
G.5 ⟶ G.36	0 ⟶ [...]	53 ⟶ x	57 ⟶ 48 - 9	58 ⟶ 77 + 14	455 ⟶ 476 + 22	0 ⟶ 2	8 ⟶ 0 -8
⟶ G.28	*37 + 37*	47 -6?	263 + 215	x	x	x	x

Tab. 8: Development of age and sex distribution in the animal lists (G.5 ⟶ G.36 ⟶ G.28) from Goshtāspi (southern Zagros mountains, ca. 1100 BCE). – For the lists G.5, G.36, and G.28, see Tables 1 to 3 above; assumed chronological seriation G.5 ⟶ G.36 within the same year and ⟶ G.28 some months after G.36 or perhaps one year after G.5. – Legend: x = numbers not preserved on the tablets. +1 = one animal more, -1 = one animal less in G.36 (compared to G.5) in the respective categories.

herds and since they were usually obliged to deliver only a part of their surplus, it was an incentive that the animals received the best care. For the regions with crown cattle, this certainly contributed to their economic development. Cattle herds not only provided dairy products, butter and cheese and their by-products, or meat and leather, but perhaps more importantly, oxen and cows served as draught animals, which were indispensible in agriculture and in transport.

With the parallel case of state investments in mind, we turn our attention again to the Iranian documentation (see Tab. 8). The three Goshtāspi lists are not dated by a year, but they most likely represent a chronological series, with the peak in second-year cows in G.5 and G.36, and in female adults in G.28, which must have been the last text in the series (see Tab. 3). Why only 200 of the more than 450 second-year cows had entered the stage of adult cow is not absolutely clear. Perhaps they remained within the category of 'second-year cows' until their first calving? With the available documentation no clear answers are possible.

It is impossible to explain exactly the background and the flow of animals represented by the numbers in G. 5 and G.36, especially since losses of animals and deliveries have always to be considered. Probably, the cattle herds were first distributed among five responsibles (G.5), but after Mr. Hahi had entered the group of herdsmen with his own herd (only in G.36), the second-year cows (probably together with new arrivals) were redistributed among individuals nos. 3 to 6; the first two men, Kiteu, Šiduaksir, kept their already incomparably large herds. The reconstructed temporal sequence G.5 ⟶ G.36 ⟶ G.28 is supported by the facts that G.36 bears the latest month name of the animal lists (month 2?, see above Section 1.2) and that G. 36 had exactly six entries as the latest list, G.28, when most second-year cows had become adult cows.

Despite these problems in detail, the documents provide an instructive example how economic wealth leads to social inbalance even at the local level: the more influential persons became richer with the new cattle arriving, and certainly more influential. Kiteu, as shown above by Azam Rayat, was not only responsible for his large herd of cattle, but he also served in an important function in the administration.

In these two exemplary cases, from the Ur III state in Mesopotamia and from the Middle-Elamite state in the Zagros region, we realize how a state handled its resources and invested them in peripheral regions. The region took profit from the state in a double role: First, in its central functions, the state handled foreign policy, including good relations to neighbours or defending its territory with its army, and it guaranteed internal stability and security, with the prosecution of criminals and the establishment of fair rules for all kinds of economic transactions (as, e.g., represented by the Mesopotamian law codes). This allowed economic development as, in our case, the larger cattle herds were not constantly in danger to be depredated by other villages or tribes, criminals or

foreign enemies. Secondly, punctual investments meant an increase of resources which allowed local incomes that could otherwise never have been reached – the people around Manlari suddenly disposed of cattle herds more than three times as large than before. The terminology suggests that the lists included not only the newly arrived cows distributed to herdsmen, but included their complete herds. The peak moving from second-year cows to female adults is one argument in that regard, a second is the fact that with the inclusion of the sixth herdsman Hahi, also the total numbers rise, which suggests that Hahi had brought his own herd with him. In the list G.5, 455 young cows and 58 young oxen (= 513 second-year animals) stand against 53 male and 57 female adults and 8 calves (= 118 adult and calves). Even if some of the young animals had come from the local husbandry, the local herds had probably counted not more than 130 heads of cattle before; thus, 500 newcomers quadrupled the herds of the local inhabitants. Possible positive impacts on the local population have already been addressed in the first part of this study. In state-directed animal husbandry, the herdsmen had an income from their herds which is a strong incentive to take good care to the animals; and the state received a constant fee from these herds, lower than the maximum profit but with extremely low transaction costs.[6]

The textual data attests to the same practice of state investments in cattle in Ur III Mesopotamia and in the southern Zagros in the Middle Elamite period. Despite the similar practice, the difference in numbers is striking: 10 to 20 second-year cows for a province in the Ur III state, but more than 400 for Manlari/Goshtāspi. Even if the Ur III provinces received cattle in various instalments over the years, they would have hardly reached the numbers of the Goshtāspi documents. Does this indicate that Manlari was installed as a special outpost of the crown?

The focus on resilience, crisis management, has directed our attention to the people who were affected by economic measures of the state. This is a most welcome redirection of historical socio-economic perspectives which have been and still are too often attracted by the centres of power. Local communities could thus profit economically from a stable state, and this concerned peripheral regions as well. On the other hand, a crisis of the state administration must have severely affected the wealth of the local communities, and the decline of a kingdom thus mattered also for its former subjects living in distant mountain regions, and as the examples have shown, even in such basic matters of their subsistence economy as cattle husbandry.

6 As Azam Rayat has discussed above, young male animals ended up in the kitchens of the elite in the capital Anshan Tall-e Malyan; but this covers only one of the various uses of cattle.

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The authors

Azam Rayat studied graphic design from 1998 to 2005 at the Ghodsie Technical and Vocational Institute in Sari (Iran) and the Dr. Shariati Technical Faculty at Teheran, and worked for various archaeological excavations in Iran. At Ludwig-Maximilians-Universität München, Germany, she studied Assyriology from 2011 to 2018. Since 2020 she works on her dissertation project, an edition and historical evaluation of the Middle Elamite tablets from Goshtāspi, Iran.

Azam Rayat – Institut für Assyriologie und Hethitologie, Ludwig-Maximilians-Universität München, Geschwister-Scholl-Platz 1, 80539 Munich, Germany. azam.rayat@lmu.de.

Walther Sallaberger studied Assyriology, Near Eastern Archaeology, Classical Archaeology and Linguistics at Innsbruck (Austria) and München, where he finished his dissertation in 1992. After his habilitation at Leipzig university he became professor of Assyriology at LMU München in 1999. His research interests include the interpretation of administrative documents in cuneiform, the role of writing, and the reconstruction of lifestyles and environments from written documents.

Walther Sallaberger – Institut für Assyriologie und Hethitologie, Ludwig-Maximilians-Universität München, Geschwister-Scholl-Platz 1, 80539 Munich, Germany. wasa@lmu.de.