CHAPTER 6

Grappling with Diversity in Livestock-Related, Non-Agriculturist Archaeology in the Light of Genetic Research into the Lactase Persistence Allele, -14010*C, in Southern Africa

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1 Introduction

The paper by Breton et al. (2014) demonstrating a shared ancestry between an eastern Africa population and the Khoe-speaking Nama of southern Africa has freed archaeologists to consider once again the place of demic diffusion in the spread of the first domestic animals without agriculture, to southern Africa. This follows its unpopularity as an explanation for change amongst the southern Africanist archaeological community in the 1990s and early 2000s (Kinahan, 1991; Sadr, 1998, 2003, 2008; Orton, 2015). It is difficult to separate demic diffusion from cultural diffusion using archaeology, as evidenced in debates worldwide.

This paper looks at the livestock-related, non-agriculturist archaeology in southern Africa in the light of the new genetic insights into the distribution of the lactase persistence allele in southern Africa. We focus on the spread of livestock without agriculture, a process that is connected to Khoe-language speakers. Agro-pastoralism, the spread of farming with speakers of Bantu-languages, is occasionally mentioned for comparative purposes. We briefly review the archaeological evidence for the last 3000 years BP in southern Africa. We then present the modern day southern African distribution of lactose persistence and compare this with the archaeological evidence for livestock-keeping. Finally we consider ethnographic and historic sources for milk-drinking in southern Africa.

2 Review of the Archaeological Evidence from Approximately 3000 BP, Southern Africa

Southern Africa is here defined as countries to the south of Congo, the Democratic Republic of Congo and Tanzania. From about 2100 years ago, the
first, very slight evidence for pottery and domestic stock appears at sites that are conventionally associated with the spread of livestock-keeping without agriculture (referred to as Later Stone Age (LSA) sites in this chapter) (see Lander and Russell (2018) for a detailed review of the data from 551 BC to AD 1056). The most securely identified and directly dated sheep specimen derives from the site Spoegrivier on the western half of southern Africa and dates to around 2100 years ago (Coutu et al., 2021). The earliest appearance of domestic cattle at sites conventionally associated with the spread of farmers speaking Bantu-languages occurs from about 1750 BP onwards (referred to as farmer sites in this chapter). At around 1500 years BP livestock counts reach a peak at Later Stone Age sites, with evidence of caprines outweighing cattle, whilst in the summer rainfall area, on the eastern side of southern Africa, many farmer sites have evidence of livestock-keeping in the form of cattle bones (Figure 6.1). From 1300 years BP, the number and distribution of farmer-related sites steadily increase, whilst the number of Later Stone Age livestock-related sites remain constant from this period onwards. Notably LSA sites have consistently low numbers of domestic livestock (Russell and Lander, 2015). Cattle are rare. The total cattle count (MNI) at all LSA sites is just 21, whilst that for caprines (mainly sheep) is 365 (Russell and Lander, 2015).

Figure 6.1 Archaeological evidence for livestock in Southern Africa, 551 BC to AD 1058
Contemporary with the first appearance of livestock is pottery. However, attempts to link it with the spread of livestock at Later Stone Age sites based on stylistic analysis have been unfruitful (Sadr and Sampson, 2006; Sadr, 2008; see also Smith, 2008, 2017). Lander and Russell (2020) suggest that pottery spread rapidly amongst hunter-gatherers from its first appearance in a process of cultural diffusion, which might also have carried domestic livestock, particularly sheep, across South Africa along already established exchange networks (see also Sadr, 2004; Russell, 2017).

3 Distribution of the Southern African Lactase Persistence Allele, -14010*C Compared to the Archaeological Evidence for Livestock

The presence of the east African lactase persistence allele, -14010*C, amongst present-day southern African populations is important because it signifies the presence of a proto-historic, fresh-milk-drinking pastoral population in southern Africa, and in the case of the Nama, a degree of relatedness to an East African source population (Breton et al., 2014; Macholdt et al., 2014). In southern Africa, 59 ethnic population groups have been screened for the LP allele (Table 6.1 and Figure 6.2) (Coelho et al., 2009; Tornianen et al., 2009; Breton et al., 2014; Macholdt et al., 2014; Jones et al., 2015; Pinto et al., 2016). These include Afrikaans-, Khoesan- and Bantu- language-speakers from agro-pastoralist, hunter-gatherer and agriculturist communities. The geographical coverage includes parts of Angola, Namibia, Botswana, Zambia, Kingdom of Eswatini, Mozambique and South Africa (Figure 6.3).

The lactase persistence allele reflects the continuous consumption of fresh milk from one generation to the next (Tishkoff et al., 2007; Breton et al., 2014; Ranciaro et al., 2014). Its presence is thus indicative of a group that either keeps livestock and drinks fresh milk or gets fresh milk regularly from a continuous relationship with livestock-keepers.

In the review of LP -14010*C allele amongst extant southern African population groups, twelve have the allele at frequencies of 10% or above (Table 6.1). The highest incidence is found amongst the Namibian Nama Khoe-speaking pastoralists (35.7%) (Breton et al., 2014; Macholdt et al., 2014). Nine of these groups are found in northern/north-western parts of southern Africa. The remaining three are distinctive. Two are eastern Bantu-language speaking groups (Map Code 15 and 35, Figure 6.4). The third is an Afrikaans-speaking community of mixed Khoesan ancestry, sampled in the western Cape, South Africa (Breton et al., 2014) (map code 3, Figure 6.4).
| Map code | Ethnic group | Subsistence base, language group, ref. | N of individuals |
|----------|--------------|----------------------------------------|------------------|
| 1        | Nama         | Pastoralist Khoe Breton et al. 2014    | 22               |
| 2        | Askham Coloured | Not provided Khoe – North Breton et al. 2014 | 20               |
| 3        | Wellington Coloured | Not provided Afrikaans Breton et al. 2014 | 20               |
| 4        | Colesberg Coloured | Not provided Afrikaans Breton et al. 2014 | 20               |
| 5        | /Gui and //Gana | Hunter-gatherer Khoe Breton et al. 2014 | 20               |
| 5        | //Gana       | Hunter-gatherer Khoe Macholdt et al. 2014 | 10               |
| 5        | /Gui         | Hunter-gatherer Khoe Macholdt et al. 2014 | 17               |
| 6        | Khwe         | Hunter-gatherer Khoe Breton et al. 2014 | 19               |
| 6        | Khwe         | Hunter-gatherer Khoe Breton et al. 2014 | 19               |
| 7        | Ju/'hoansi   | Hunter-gatherer Ju - Northeast - Ju/'hoan Breton et al. 2014 | 20               |
| 8        | Ju/hoan_ North | Hunter-gatherer Kx'a Macholdt et al. 2014 | 21               |
| Sample region                      | Decimal latitude | Decimal longitude | \(-14010^\circ C\) freq. | Ref.                          |
|-----------------------------------|------------------|-------------------|-------------------------|-------------------------------|
| Windhoek, Namibia                 | -22.5624         | 17.06599          | 0.357                   | Breton et al. (2014) Macholdt et al. (2014) |
| Askham, Northern Cape, South Africa | -26.9834         | 20.78333          | 0.225                   | Breton et al. (2014)          |
| Wellington, Western Cape, South Africa | -33.6818         | 19.01023          | 0.1                     | Breton et al. (2014)          |
| Colesberg, Northern Cape, South Africa | -30.8388         | 25.07629          | 0.025                   | Breton et al. (2014)          |
| Kutse Game Reserve, Kalahari, Botswana | -23.4223         | 24.04879          | 0.071                   | Breton et al. (2014)          |
| Kutse Game Reserve, Kalahari, Botswana | -23.4223         | 24.04879          | 0.2                     | Macholdt et al. (2014)        |
| Kutse Game Reserve, Kalahari, Botswana | -23.4223         | 24.04879          | 0.088                   | Macholdt et al. (2014)        |
| Schmidtsdrif Northern Cape, South Africa | -28.8134         | 24.10132          | 0.029                   | Breton et al. (2014)          |
| Rootfontein, Namibia              | -19.6113         | 18.10939          | 0.029                   | Breton et al. (2014)          |
| Tsumkwe, Namibia                  | -19.6009         | 20.50384          | 0.029                   | Breton et al. (2014)          |
| North West, Botswana              | -20.5814         | 21.67013          | 0.024                   | Macholdt et al. (2014)        |
| Map code | Ethnic group | Subsistence base, language group, ref. | N of individuals |
|----------|--------------|--------------------------------------|------------------|
| 9        | Ju|hoan South | Hunter-gatherer Kx’a Macholdt et al. 2014 | 26               |
| 10       | !Xun | Hunter-gatherer Ju - Northwest - /Xũu Breton et al. 2014 | 20               |
| 10       | !Xun | Hunter-gatherer Ju - Northwest - /Xũu Breton et al. 2014 | -                |
| 20       | !Xuun | Hunter-gatherer Kx’a Macholdt et al. 2014 | 19               |
| 47       | !Xuun | Hunter-gatherer Kx’a Pinto et al. 2016 | -                |
| 11       | Karretjie People | Hunter-gatherer and herder /Xam descendants Breton et al. 2014 | 20               |
| 12       | ≠Khomani | Hunter-gatherer herders Germanic Tuu Breton et al. 2014 | 20               |
| 13       | Herero | Farmer and herder western Bantu Breton et al. 2014 | 14               |
| 14       | Herero | Pastoralist western Bantu Macholdt et al. 2014 | 21               |
| 38       | Kuvale/ Herero | Pastoralist west Savanna Bantu Coelho et al. 2009 | -                |
| 42       | Kuvale | Farming with some pastoralism west Savanna Bantu Pinto et al. 2016 | -                |
| Sample region                              | Decimal latitude | Decimal longitude | -14010*C freq. | Ref.                           |
|--------------------------------------------|------------------|-------------------|----------------|-------------------------------|
| Ghanzi, Botswana border with Namibia       | -21.1943         | 21.0619           | 0.058          | Macholdt et al. (2014)        |
| Schmidtsdrif, Northern Cape, South Africa  | -28.8134         | 24.1011           | 0.038          | Breton et al. (2014)          |
| Grootfontein, Namibia                      | -19.6113         | 18.1939           | 0.038          | Breton et al. (2014)          |
| Nyae Nyae, Namibia                         | -19.7057         | 20.4973           | 0.053          | Macholdt et al. (2014)        |
| Mupa, Angola                               | -16.1831         | 15.7670           | 0.014          | Pinto et al. (2016)           |
| Colesberg, Northern Cape, South Africa     | -30.8388         | 25.0762           | 0.083          | Breton et al. (2014)          |
| Askham, Northern Cape, South Africa        | -26.9834         | 20.7833           | 0.11           | Breton et al. (2014)          |
| Windhoek, Namibia                          | -17.0624         | 17.0659           | 0              | Breton et al. (2014)          |
| Windhoek, Namibia                          | -22.5624         | 17.0659           | 0.071          | Macholdt et al. (2014)        (see Torniainen et al. 2009 and Breton et al. 2014) |
| Namibe, Angola                             | -16.0277         | 12.4363           | 0.06           | Coelho et al. (2009)          (see Alves et al. 2011) |
| Namibe, Angola [1 sample location]         | -14.5436         | 13.1968           | 0.037          | Pinto et al. (2016)           (see Coelho et al. 2009) |
| Map code | Ethnic group                          | Subsistence base, language group, ref.                                           | N of individuals |
|----------|--------------------------------------|------------------------------------------------------------------------------------|------------------|
| 42       | Kuvale                               | Farming with some pastoralism west Savanna Bantu                                   | -                |
| 42       | Kuvale                               | Farming with some pastoralism west Savanna Bantu                                   | -                |
| 15       | Sotho-Tswana and Zulu                | Agropastoralist farmer southeastern Bantu                                          | 16 (Sotho-Tswana) 25 (Zulu) |
| 16       | Taa-East                             | Hunter-gatherer Tuu                                                                  | 11               |
| 17       | Taa-North                            | Hunter-gatherer Tuu                                                                  | 11               |
| 18       | Taa-West                             | Hunter-gatherer Tuu                                                                  | 20               |
| 19       | ||Hoan                               | Hunter-gatherer Kx’a                                                                  | 7                |
| 21       | ||Ani                                | Hunter-gatherer Khoe                                                                  | 11               |
| 22       | Buga                                 | Hunter-gatherer Khoe                                                                  | 9                |
| 23       | ||Xo                                  | Hunter-gatherer Khoe                                                                  | 19               |
| Sample region                       | Decimal latitude | Decimal longitude | -14010*C freq. | Ref.                          |
|------------------------------------|------------------|-------------------|----------------|-------------------------------|
| Namibe, Angola [2 sample location] | -15.3969         | 12.83899          | 0.037          | Pinto et al. (2016) (see Coelho et al. 2009) |
| Namibe, Angola [3 sample location] | -15.5753         | 12.76128          | 0.037          | Pinto et al. (2016) (see Coelho et al. 2009) |
| Various regions, South Africa      | -27.9865         | 29.86269          | 0.1            | Breton et al. (2014)          |
| Kgalagadi, Botswana                | -24.3548         | 22.81767          | 0.045          | Macholdt et al. (2014)        |
| Kgalagadi, Botswana                | -23.59           | 21.61049          | 0              | Macholdt et al. (2014)        |
| Kgalagadi, Botswana                | -24.7803         | 20.10442          | 0.025          | Macholdt et al. (2014)        |
| Kgalagadi, Botswana                | -24.3368         | 22.34             | 0              | Macholdt et al. (2014)        |
| North West, Botswana               | -18.5167         | 21.94934          | 0.091          | Macholdt et al. (2014)        |
| North West, Botswana               | -18.3716         | 21.85806          | 0              | Macholdt et al. (2014)        |
| Caprivi Strip                      | -17.9231         | 22.72381          | 0.079          | Macholdt et al. (2014)        |
| Map code | Ethnic group | Subsistence base, language group, ref. | N of individuals |
|----------|--------------|--------------------------------------|-----------------|
| 24       | Damara       | Hunter-gatherer and pastoralist Khoe Macholdt et al. 2014 | 34              |
| 25       | Hailom       | Hunter-gatherer Khoe Macholdt et al. 2014 | 40              |
| 26       | Naro         | Hunter-gatherer Khoe Macholdt et al. 2014 | 19              |
| 27       | Shua         | Hunter-gatherer Khoe Macholdt et al. 2014 | 27              |
| 28       | Tshwa        | Hunter-gatherer Khoe Macholdt et al. 2014 | 15              |
| 29       | Himba        | Pastoralist west Savanna Bantu Macholdt et al. 2014 | 16              |
| 30       | Kgalagadi    | Agropastoralist southeastern Bantu Macholdt et al. 2014 | 20              |
| 31       | Tonga        | Agriculturist southeastern Bantu Macholdt et al. 2014 | 17              |
| Sample region               | Decimal latitude | Decimal longitude | -14010°C freq. | Ref.                  |
|-----------------------------|------------------|-------------------|----------------|-----------------------|
| Kunene Region, Namibia      | −20.4608         | 14.0402           | 0.044          | Macholdt et al. (2014) |
| Kunene Region, Namibia      | −19.6687         | 14.70835          | 0.088          | Macholdt et al. (2014) |
| Ghanzi, Botswana            | −22.01           | 21.2326           | 0.053          | Macholdt et al. (2014) |
| Makgadikgadi, Botswana      | −20.5509         | 25.8031           | 0.074          | Macholdt et al. (2014) |
| Makgadikgadi, Botswana      | −21.3433         | 26.0438           | 0.167          | Macholdt et al. (2014) |
| Skeleton Coast, Namibia      | −19.5689         | 13.67961          | 0.125          | Macholdt et al. (2014) |
| Namibe, Angola [1 sample location] | −17.0017       | 12.43598          | 0.087          | Pinto et al. (2016) (see Macholdt et al. 2014) |
| Namibe, Angola [2 sample location] | −16.8911       | 12.43598          | 0.087          | Pinto et al. (2016) (see Macholdt et al. 2014) |
| Kgalagadi, Botswana         | −24.7289         | 22.70295          | 0              | Macholdt et al. (2014) |
| southern Zambia             | −17.7183         | 26.82519          | 0              | Macholdt et al. (2014) |
| Map code | Ethnic group        | Subsistence base, language group, ref.                                      | N of individuals |
|----------|---------------------|---------------------------------------------------------------------------|------------------|
| 32       | Tswana              | Agropastoralist southeastern Bantu Macholdt et al. 2014                   | 18               |
| 33       | Nkoya               | Agropastoralist eastern Bantu Macholdt et al. 2014                        | 16               |
| 34       | Wambo               | Agriculturist western Bantu Macholdt et al. 2014                          | 8                |
| 35       | !Xhosa              | Agropastoralist southeastern Bantu Torniainen et al. 2009                 | 109              |
| 35       | !Xhosa              | Agropastoralist southeastern Bantu Ranciaro et al. 2014                   | 16               |
| 36       | Venda               | Agropastoralist southeastern Bantu Ranciaro et al. 2014                   | 18               |
| 37       | Ovim-bundu          | Mostly agriculturists (cattle raising not crucial for subsistence) west Savanna Bantu Coelho et al. 2009 | -                |
| 39       | Nyaneka-Nkhumbi     | Agropastoralist (predominantly cattle raisers) west Savanna Bantu Coelho et al. 2009 | -                |
| 40       | Guang-uela          | Agropastoralist west Savanna Bantu Coelho et al. 2009                    | -                |
| Sample region                                      | Decimal latitude | Decimal longitude | -14010°C freq. | Ref.                                                                 |
|---------------------------------------------------|------------------|-------------------|----------------|----------------------------------------------------------------------|
| Kweneng, southern Botswana                        | −24.3324         | 25.6049           | 0.028          | Macholdt et al. (2014) (see Breton et al. 2014)                        |
| Zambia                                            | −14.6633         | 25.50005          | 0.031          | Macholdt et al. (2014)                                                |
| Northern Nambia                                   | −17.7569         | 16.63925          | 0              | Macholdt et al. (2014)                                                |
| Eastern Cape and western Cape, South Africa       | −33.1477         | 26.54454          | 0.128          | Torniainen et al. (2009)                                              |
| Western Cape, South Africa                        | −34.079          | 19.10157          | 0.1429         | Ranciaro et al. (2014)                                                |
| Thohoyandou, South Africa                         | −23.1016         | 30.59716          | 0              | Ranciaro et al. (2014)                                                |
| Namibe, Angola                                    | −14.733          | 13.24521          | 0.01           | Coelho et al. (2009)                                                 |
| Namibe, Angola                                    | −15.1194         | 12.71634          | 0.03           | Coelho et al. (2009)                                                 |
| Namibe, Angola                                    | −15.44           | 12.92882          | 0              | Coelho et al. (2009)                                                 |
| Map code | Ethnic group        | Subsistence base, language group, ref.                                                                 | N of individuals |
|---------|---------------------|--------------------------------------------------------------------------------------------------------|------------------|
| 43      | Kwepe               | Shepherd/livestock-keeper Khoe-Kwadi (recently replaced by Kuvale) Pinto et al. 2016                  | -                |
| 43      | Kwepe               | Shepherd/livestock-keeper Khoe-Kwadi (recently replaced by Kuvale) Pinto et al. 2016                  | -                |
| 44      | Kwisi               | Hunter-gatherer (recently cattle-keepers) west Savanna Bantu Pinto et al. 2016                         | -                |
| 44      | Kwisi               | Hunter-gatherer (recently cattle-keepers) west Savanna Bantu Pinto et al. 2016                         | -                |
| 45      | Twa                 | Hunter-gatherer (recently cattle-keepers) west Savanna Bantu Pinto et al. 2016                         | -                |
| 45      | Twa                 | Hunter-gatherer (recently cattle-keepers) west Savanna Bantu Pinto et al. 2016                         | -                |
| 46      | Tjimba              | Hunter-gatherer (cattle-less pastoralists) west Savanna Bantu Pinto et al. 2016                         | -                |
| 48      | Yao                 | Agriculturist Kaskazi–speaking Pinto et al. 2016                                                     | -                |
| 49      | Nyanja              | Agriculturist southeastern Bantu Pinto et al. 2016                                                    | -                |
| Sample region                              | Decimal latitude | Decimal longitude | -14010°C freq. | Ref.               |
|--------------------------------------------|------------------|-------------------|----------------|--------------------|
| Namibe, Angola [1 sample location]         | -15.8062         | 12.1081           | 0.044          | Pinto et al. (2016) |
| Namibe, Angola [2 sample location]         | -15.8274         | 12.45268          | 0.044          | Pinto et al. (2016) |
| Namibe, Angola [1 sample location]         | -15.7196         | 12.45046          | 0.175          | Pinto et al. (2016) |
| Namibe, Angola [2 sample location]         | -15.5978         | 12.73733          | 0.175          | Pinto et al. (2016) |
| Namibe, Angola [1 sample location]         | -15.8536         | 12.12054          | 0.194          | Pinto et al. (2016) |
| Namibe, Angola [2 sample location]         | -16.8092         | 12.50899          | 0.194          | Pinto et al. (2016) |
| Namibe, Angola                             | -17.1096         | 12.69041          | 0.233          | Pinto et al. (2016) |
| Northern Mozambique                        | -12.9998         | 35.30324          | 0              | Pinto et al. (2016) (see Alves et al. 2011) |
| Mozambique                                 | -14.9577         | 34.16792          | 0              | Pinto et al. (2016) (see Alves et al. 2011) |
| Map code | Ethnic group | Subsistence base, language group, ref. | N of individuals |
|----------|--------------|----------------------------------------|-----------------|
| 50       | Makua        | Agriculturist southeastern Bantu        | -               |
|          |              | Pinto et al. 2016                      |                 |
| 51       | Tswa         | Mixed agriculturist southeastern Bantu  | -               |
|          |              | Pinto et al. 2016                      |                 |
| 52       | Shangaan     | Mixed agriculturist southeastern Bantu  | -               |
|          |              | Pinto et al. 2016                      |                 |
| 53       | Chopi        | Agriculturist southeastern Bantu        | 3               |
|          |              | Coelho et al. 2009                     |                 |
| 54       | Ronga        | Agriculturist southeastern Bantu        | 15              |
|          |              | Coelho et al. 2009                     |                 |
| 55       | Sena         | Agriculturist southeastern Bantu        | 2               |
|          |              | Coelho et al. 2009                     |                 |
| 56       | Ndau         | Mixed agriculturist southeastern Bantu  | 15              |
|          |              | Coelho et al. 2009                     |                 |
| 57       | Chwabo       | Agriculturist southeastern Bantu        | 4               |
|          |              | Coelho et al. 2009                     |                 |
| 58       | Shona        | Mixed agriculturist southeastern Bantu  | 1               |
|          |              | Coelho et al. 2009                     |                 |
| 59       | Swazi        | Agropastoralist southeastern Bantu      | 12              |
|          |              | Segal et al. 1987                      |                 |
| Sample region         | Decimal latitude | Decimal longitude | -14010°C freq. | Ref.                                      |
|----------------------|------------------|-------------------|----------------|-------------------------------------------|
| Mozambique           | −15.2267         | 39.23246          | 0              | Pinto et al. (2016) (see Alves et al. 2011) |
| Mozambique           | −21.4492         | 35.00139          | 0              | Pinto et al. (2016) (see Alves et al. 2011) |
| Mozambique           | −24.8958         | 32.98332          | 0.022          | Pinto et al. (2016) (see Alves et al. 2011) |
| Mozambique           | −24.792          | 34.37146          | 0              | Coelho et al. (2009) (see Alves et al. 2011; Pinto et al. 2016) |
| Southern Mozambique  | −26.345          | 32.50994          | 0              | Coelho et al. (2009) (see Alves et al. 2011; Pinto et al. 2016) |
| Mozambique           | −17.7261         | 34.95491          | 0              | Coelho et al. (2009) (see Alves et al. 2011; Pinto et al. 2016) |
| Mozambique           | −19.3029         | 34.55766          | 0              | Coelho et al. (2009) (see Alves et al. 2011; Pinto et al. 2016) |
| Mozambique           | −17.1928         | 36.45974          | 0              | Coelho et al. (2009) (see Alves et al. 2011; Pinto et al. 2016) |
| Harare, Zimbabwe     | −17.9233         | 30.95264          | 0              | Coelho et al. (2009)                       |
| Mbabane, Eswatini    | −26.3323         | 31.15249          | 0              | Segal et al. (1987) (see Holden and Mace 2009). |
Three patterns in the distribution of the LP allele stand out. These are considered in relation to the archaeological evidence for livestock-keeping.

1. The lactase persistence allele occurs in its highest frequencies amongst livestock-keepers without agriculture or recent livestock-keepers without agriculture, irrespective of the language group.

People have retained the ability to digest milk in the western, drier half of southern Africa for at least the last 1300 years (Breton et al., 2014). This area is unsuitable for the cultivation of the indigenous summer rainfall crops, sorghum and millet, due to the low rainfall. This confirms Simoons (1970, 695) argument that the “Low incidence of intolerance, it is held, would develop over time in a group that has an abundant milk supply, that has alternate foodstuffs inadequate in amount and quality, and that consumes milk in lactose-rich forms.” The contemporary distribution of groups with lactase persistence matches the distribution of Later Stone Age sites with evidence of livestock (Figure 6.5) – confirming the strong
The Lactase persistence allele, -14010*C, in southern Africa

Figure 6.3  Map showing the distribution of the East African lactase persistence allele in Southern African

Figure 6.4  Map showing Southern African populations with the highest prevalence of LP Allele -14010*C
Figure 6.5  Archaeological evidence for livestock-keeping with and without agriculture compared to the distribution of the lactase persistence allele.

Figure 6.6  Archaeological evidence for livestock-keeping at approximately 1000 – 1200 BP and the lactase persistence allele overlaid on the present-day distribution of African trypanosomiasis.
association of the ability to digest lactose with pastoralism (Holden and Mace, 1997). The ethnographic and historic record of milk consumption – in its fresh lactose-rich form - amongst the Khoe supports this association (Lombard and Parson, 2015).

Unique to the southernmost part of southern Africa is a winter rainfall zone that stretches from the Cape northwards into Namibia (Figure 6.1). Seasonal movement across its boundaries to the summer rainfall zone would have provided pastoralists with all year round rainfall that would be necessary for specialized milch pastoralism to flourish, mimicking the bimodal rainfall that is seen as central to the rise of pure milch pastoralism in East Africa 3000 years ago (Marshall, 1990; Marchant et al., 2018; Russell, 2020).

2. Southern Africa's Bantu-language speaking groups have a low incidence of the allele as compared to Khoe-speaking groups.

This low incidence might reflect (1) the absence of a history of livestock-keeping. The trypanosomiasis belt excludes much of tropical Africa as a cattle-keeping area (Simoons, 1974). Where it is endemic in southern Africa we find Bantu-language speaking matrilineal farmers without livestock (Holden and Mace, 2003) (Figure 6.6), or (2) the absence of fresh milk consumption rather than the absence of livestock. The cultural practice of drinking sour milk products is well documented amongst southern African Bantu-speaking peoples (Table 6.2). It is hard to find any record of the consumption of fresh milk by southern Bantu-language speakers with the exception of herd boys, who may drink milk directly from cows when out herding, and fresh milk sometimes given to children. Fermented, sour milk products have a reduced lactose content making them more digestible to lactase deficient groups (Holden and Mace, 1997). Segal et al. (1983), in their study of lactase persistence in southern African population groups show that raw milk, fermented in a gourd in the traditional way, contains 2.6% lactose, compared to the 4.7% lactose of full cream fresh milk. Thirdly, (3) those southern African Bantu-language speakers without the LP allele might represent a demic migration from the area of northern Angola, Gabon, and Congo in a southeastward direction towards South Africa, rather than from an origin in East Africa. The archaeological evidence, whilst fairly robust for the connection between East Africa and South Africa (Parkington and Hall, 2012), is unhelpful for tracing connections to western-central Africa. Such evidence for a western stream of demic migration from Angola to South Africa, as suggested by Huffman (2007) on the basis of pottery styles is weak and must be revisited (Parkington and Hall, 2012; Lander...
| Group      | Country                        | Sour cows's milk | Fresh cows's milk | Reference                                                                 |
|------------|--------------------------------|------------------|-------------------|---------------------------------------------------------------------------|
| Swazi      | Eswatini                       | Emasi (mainly drunk by children) | Herdboys in the veld milk directly into their mouths (Jones 1963: 75) | Simatende et al. 2015; Kuper 1986: 44; Jones 1963                        |
| Xhosa      | Eastern Cape, South Africa     | Amasi            | Milk 'always used sour' (Hunter 1961:105) | Beukes et al. 2001; Hunter 1961; Shaw and van Wermelo 1974: 247, 250 |
| Zulu       | South Africa                   | Amasi            | Hardly ever drank "green milk" | Beukes et al. 2001                                                       |
| Southern Sotho | South Africa                 | Mafi             |                   | Beukes et al. 2001                                                       |
| Botswana   |                               | Madila           |                   | Ohiokpehai and Jagow 1998                                                |
| South Africa | Zambia                      | Sethemi          |                   | Kebede et al. 2007                                                       |
| Zambia     |                               | Mabisi           |                   | Jans et al. 2017                                                         |
| Nharo      | Ghanzi, Botswana               |                  | Fresh goats' milk | Guenther 1986                                                            |
| Gwi        | Kutse, Botswana                |                  | Fresh goats' milk | Ikeya 1993, Sugwara 1991                                                 |
| Gana       | Kutse, Botswana                |                  | Fresh goats' milk | Ikeya 1993, Sugwara 1991                                                 |
| Hunter-gatherer stock-keepers | Nyae Nyae, Nambia | Sour milk products |                   | Marshall and Ritchie, 1984                                                |
| Nama       | Richtersveld, Northern Cape, South Africa | Soured milk |                   | Schapera 1930                                                            |
and Russell, 2018). The Kalundu pottery tradition of the western stream, purporting to link pottery found at the coastal midden site of Benfica, in Angola to sites in the eastern half of South Africa, includes very few sites and the basis of the argument is unclear (cf. Huffman, 2007) (Table 6.3).

And lastly, (4) it might reflect interaction and proximity with a milch pastoralist group. The high incidence of the LP allele among the Xhosa, Sotho-Tswana and Zulu agro-pastoralists is suggestive of a long history of interaction between their ancestral groups and Khoe pastoralists. These Bantu-language speaking agro-pastoralists lived close to the historically known territory of Khoe pastoralists along the natural boundary to farmer expansion, the summer rainfall boundary. This boundary is also seen in the archaeological distribution of LSA sites as compared to farmer sites (Figure 6.1) (Parking and Hall, 2012). Genetic and linguistic studies reflect a similar pattern of the long interaction of Khoisan and Bantu-speaking groups (Pakendorf et al., 2017).

3. Non-Khoe-speaking hunter-gatherers have low levels of the allele. This is not unexpected as this is one of the few examples of foragers who resisted and rejected the more labour intensive economies of animal domestication and crop production (Russell and Lander, 2015). More interesting and requiring further investigation is why Khoe-speaking hunter-gatherers, in particular, have the LP allele. Examples of hunter-gatherers with the LP allele, in frequencies of up to 20%, are the Khoe-speaking Gui and Gana of the Kutse Game Reserve, in central Botswana (Table 6.1). Although they live by hunting and gathering, their livestock keeping is well-documented (Ikeya, 1993; Osaki, 1984; 1990; Sugawara, 1991; Tanaka, 1969, 1976). Livestock, predominately goats, are never slaughtered but are kept as a social rather than a subsistence strategy, to build alliances and to use in economic exchanges (Russell, 2017). The low levels of livestock at LSA sites might reflect such a livestock-keeping and circulating system. Milking would fit easily within such a system, although little milking was recorded amongst these ethnographically observed hunter-gatherer groups (Ikeya (1993) records 200 ml of milk being collected on a particular day), there is evidence of them following milking practices. For example, young animals are separated from their mothers during the day and dung is applied to their udders to deter feeding. Goat-keeping within a similar system is also mentioned by Guenther (1986), who notes the drinking of fresh goats’ milk among the Nharo of Ghanzi, Botswana.
Table 6.3 Sites with pottery which fit Huffman’s (2007) western stream of demic diffusion among Bantu-language speaking farmers

| Site, Country, site type | Radiocarbon date | Calibrated Date | Reference |
|--------------------------|------------------|----------------|-----------|
| Benfica, Angola Coastal shell midden | 1810±50 Pta-212 | AD 212–322 | Kalundu | Dos Santos and Ervedosa 1970; Vogel and Marais 1971; Huffman 2005, 2007 |
| Gundu, Zambia Inland open-air | 1510±85 GX-114 | AD 480–658 | Kamangoza type pottery showing affiliation to Kalundu, Dambwa and Kumadzulo ware and has origins with Naviundu pottery in the Congo. | Huffman 1989, 2007 |
| Wosi, South Africa Inland open-air riverside | 1460±50 Pta-4100 | AD 592–662 | Msuluzi | Van Schalkwyk 1994 |
| Lydenburg Head site, South Africa Inland open-air | 1460±50 Pta-328 | AD 592–662 | Kalundu or Matola | Maggs 1980, Evers et al. 1982, Whitelaw 1996 |
| Zambezi Farm, Zambia Inland open-air | 1410±130 N-1140 | AD 544–856 | Pottery similar to Kalundu, Dambwa and Kumadzulo ware. | Vogel 1973 |
| Mhlopeni, South Africa Inland open-air riverside | 1400±50 Pta-2878 | AD 636–765 | Msuluzi | Maggs and Ward 1984 |
### Table 6.3 Sites with pottery which fit Huffman’s (2007) western stream of demic diffusion among Bantu-language speaking farmers (cont.)

| Site, Country, site type | Radiocarbon date | Calibrated Date | Western stream, kalundu tradition, pottery type | Reference |
|--------------------------|------------------|-----------------|-----------------------------------------------|-----------|
| Divuyu, Botswana          | 1400±70 Beta-13260 | AD 635–766      | Divuyu                                        | Turner 1987; Denbow 2011 |
| KwaGandaganda, South Africa | 1395±60 Wits-1918 | AD 639–765      | Msuluzi                                       | Whitelaw 1994 a,b.          |
| Mamba, South Africa       | 1390±50 Pta-4093  | AD 643–765      | Msuluzi                                       | Van Schalkwyk 1994          |
| Msuluzi Confluence, South Africa | 1370±30 Pta-2193 | AD 654–763      | Msuluzi                                       | Maggs 1980                  |
| Magogo, South Africa      | 1360±50 Pta-2874  | AD 659–765      | Msuluzi                                       | Maggs 1984                  |
| Magarape, Botswana         | 1350±80 KN-2641   | AD 648–841      | Mzonjani type pottery or Kalundu type pottery. | Cambpell et al. 1996; Huffman 2009 |
| Mpame, South Africa       | 1340±60 Pta-2019  | AD 657–830      | Msuluzi                                       | Vogel and Fuls 1999         |
| Bisoli, Botswana           | 1340±60 Wits-1099 | AD 657–830      | Bisoli                                        | Denbow and Wilmsen 1986; Campbell et al. 1996; Huffman 2007 |
### Table 6.3  
Sites with pottery which fit Huffman’s (2007) western stream of demic diffusion among Bantu-language speaking farmers  
(cont.)

| Site, Country, site type | Radiocarbon date | Calibrated Date | Western stream, kalundu tradition, pottery type | Reference |
|--------------------------|------------------|-----------------|-----------------------------------------------|-----------|
| Nqoma, Botswana Inland open-air | 1290±60 Beta-13257 | AD 685–860 | Divuyu and Xaro | Wilmsen 1989, 2011; Denbow 2011 |
| Ntsitsana, South Africa Inland open-air riverside | 1290±50 Pta-4684 | AD 685–858 | Mzuluzi and Ndondondwane | Prins and Granger 1993 |
| Nanda, South Africa Inland open-air riverside | 1275±60 Wits-1917 | AD 690–880 | Msuluzi | Whitelaw 1993 |
| Kulubele, South Africa Inland open-air riverside | 1250±40 Pta-5865 | AD 773–881 | Mzuluzi pottery and/or Ndondondwane | Binneman et al. 1992 |
| Kanono Mulapo, Namibia shell midden site | 1230±50 Pta-8656 | AD 770–960 | Kalomo pottery showing similarities to Kalundu and Gundu | Kinahan 2013; Huffman 1989 |
| Ndondondwane, South Africa Inland open-air riverside | 1220±50 Pta-238 | AD 774–819 | Ndondondwane | Maggs 1984, Van Schalkwyk et al. 1997 |
| SK17, South Africa Inland open-air | 1210±50 Pta-3507 | AD 777–967 | Garonga pottery or Kalundu (Ndondondwane/Lydenburg) pottery | Meyer 1984; Plug 1989; Huffman 2007 |
| Kalundu Mound, Zambia Inland open-air | 1160±90 SR-41 | AD 780–1020 | Kalundu | Fagan 1967 |
### Table 6.3

| Site, Country, site type | Radiocarbon date | Calibrated Date | Western stream, kalundu tradition, pottery type | Reference |
|--------------------------|------------------|-----------------|-------------------------------------------------|-----------|
| Dombashaba, Botswana Inland hilltop | 1150±80 | AD 859–1024 | Bisoli | Huffman 2005, 2007 |
| Ntshekane, South Africa Inland open-air riverside | 1150±45 | AD 893–989 | Ntshekane | Maggs and Michael 1976 |
| Kamangoza, Zambia Inland open-air | 1015±105 | AD 987–1185 | Kamangoza pottery showing affiliation to Kalundu, Dambwa and Kumadzulo ware. | Vogel 1971 |
| Isamu Pati, Zambia Inland open-air | 910±90 | AD 1046–1265 | Kalomo pottery showing similarities to Kalundu and Gundu (Naviundu from Congo (western origin) is an ancestor to Gundu pottery) | Huffman 1989, 2005 |

### Conclusions

The archaeological distribution for livestock remains over the last 2100 years shows the predominance of cattle-keeping among farmers in the eastern half of the sub-continent and sparser, yet continuous, caprine-keeping among Later Stone Age livestock-keepers in the low rainfall areas to the west. We might at a first glance expect that lactase persistence might dominate on the
eastern side of southern Africa. Genetic research shows that the reverse is true. The east African lactase persistence allele, -14010*C, is overwhelmingly found among pastoralist people in the western parts, irrespective of their language group. To explain this pattern, we turn to the ethnographic and historic record, which show the cultural practice among Bantu-speakers of drinking milk only in its fermented, lactose-reduced form. This is sometimes through its spontaneous fermentation in a gourd, at room temperature over a number of days, or through the addition of certain plants. Ethnography helps to explain why some hunter-gatherers have a high incidence of lactase persistence: they are those who have seen the social value of livestock in exchange networks, with small quantities of milk drinking. They remain overwhelmingly foragers for subsistence.

Archaeological evidence for the large herds of Khoe-owned cattle, observed historically, from the late 16th century onwards in the western and eastern Cape, which drew sailors and then settlers to southern Africa, has not been found. The archaeological picture is incomplete. For example, from 1652 to 1699, careful mercantile records show that 20,000 cattle and 40,000 sheep were traded with the Cape Khoe by the passing ships of the Dutch East India Company (VOC) (Ross, 2012). The contrast with the total 21 cattle and 365 caprine bones found across the entire 2100 year period of the archaeology of the Later Stone Age livestock-keepers, is useful as an example of just how fragmentary the archaeological record can be (Russell and Lander 2015).

There are unresolved differences between and within the genetic and the archaeological findings. For example, the timing of the arrival of the LP allele, -14010*C, is estimated to be at 1300 years BP by geneticists (Breton et al., 2014). This is 800 years later than the earliest archaeological discovery of remains of livestock in this region. On the basis of Y chromosomal evidence, Henn et al. (2009) estimate that pastoralism arrived in southern Africa from eastern Africa at around 2000 years ago. How accurate are the genetic clock estimations? Why do they differ? The ethnic identities of modern day southern African populations are complicated and complex: it would be useful to attempt to re-trace the histories of those groups sampled by geneticists.

Yet it is only by boldly confronting and challenging discrepancies between and within different disciplines that a fuller understanding of the complex history of Africa’s past will be achieved. And what satisfaction when, as in the recognition of the importance of milch pastoralism in the drier western half of southern Africa for over a millennium by scholars from genetics, ethnography and archaeology, they concur.
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