Lunarchy: The Original Human Economics of Time

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The Moon doesn't like the boys, just the girls, Nharo saying in Guenther (1989: 52).

Women's biggest husband is the moon, BaMbendjele saying in Lewis (2008: 299).

In the final analysis, all forms of economics can be reduced to an economics of time Marx (1971: 76).

Lionel Sims makes his boldest and most original claims by applying anthropological understanding of religious structures and their transformation to the archaeology of megalithic sites. In decoding Stonehenge, Avebury and other lunar/solar aligned monuments, he has shown that they are complex machines 'designed to entrain winter sunset with dark moon' (Sims 2006: 204). Further, they endow the winter setting Sun with ritual characteristics of Dark Moon, enabling a 'religious logic of estrangement' (Sims 2006: 204). The ritual potency accorded Dark Moon by Palaeolithic hunting cultures was transformed and conferred onto a solar annual cycle. In this process of 'solarization', the Sun was invested with the former religious significance of the Moon.

The phenomenological experience of processing uphill in the final Avenue approach at Stonehenge towards a descending winter sun has the effect of momentarily freezing the sunset. Such ritual prolongation demonstrated the power to 'stop time' (Sims 2006: 203). While that experience may have been shared among initiates, more esoteric, and probably kept secret among elite, insider groups, the appearance of the Moon 'within the upper window, over a minor standstill year', formed a 'reversed set of lunar phases culminating at winter solstice with dark moon' (Sims 2006: 204). Time is controlled and sent into reverse.

Sims proposes 'specialist knowledge of the lunistice moon' as the preserve of a 'high-ranking group', with solar symbolism now invested with concepts of male power (2006: 204). If Sims is right, this is the symbolic hallmark of a process of counter-revolution, shifting the balance of gender power towards masculinisation of ritual and new forms of hierarchy: patriarchy. It took huge costs of time and energy invested in the construction of Stonehenge, and other megalithic monuments, to effect this shift. This implies it was no simple matter to annex the ancient syntax of ritual power organised by the Moon.

But where did the 'time-resistant' lunar syntax come from? It is unlikely that patriarchal Neolithic societies invented this form of time-keeping. Yet it persists even in modern patriarchal 'world' religions. All world religions are organised on lunar calendars. In fact, it may be a defining feature of religion to work with the Moon – the source of magic, transformation and the other world, the fundamental metaphor of life, death and resurrection.

One telling marker of a shift in gender relations around the onset of the Neolithic is the bottleneck of male-transmitted Y-chromosomes detected within the last 10,000 years (Karmin *et al.* 2015). This rapid reduction in diversity of male lineages corresponds to a change in the archaeological record characterised by the spread of Neolithic

cultures. These demographic, social and cultural changes radically affected the degree of variance in male reproductive success. Among egalitarian African hunter-gatherers, the opposite genetic signature of high Y-chromosome diversity is found (Tishkoff *et al.* 2007), implying more equal fitness, as a result of equal distribution and access to resources (see e.g. Stibbard-Hawkes *et al.* 2020 on Hadza generalised sharing). One hypothesis proposes warfare among patrilineal clans to explain the collapse of Y diversity (Zeng, Aw and Feldman 2018).

I do not intend to investigate the question of changing Neolithic gender relations here, but to argue that Palaeolithic hunting cultures were both more gender fluid and egalitarian from their African origins (Power and Watts 1997, 1999; Power 2019). In the first part of the chapter, I will set out the main reasons for inferring an original gender egalitarianism, particularly among African hunter-gatherer ancestors during our speciation. Then I will consider how female strategies for maintaining egalitarian gender relations generated a specifically lunar ritual syntax. Lastly I will examine East, Central and Southern African hunter-gatherer lunar cosmology and its impact on gender politics.

How gender egalitarianism made us human

There are several indicators in our species biology, our life history and our evolved psychology – the evidence of our bodies and minds – of an increasing egalitarian tendency in human evolution. This necessarily had a dimension of gender (Power 2019).

Egalitarian features

The egalitarian features of our anatomy, life history and psychology include:-

1. *Our eyes* – Alone of over 200 primate species, we have evolved eyes with an elongated shape and a bright white sclera background to a dark iris (Kobayashi and Kohshima 2001). Known as 'cooperative eyes' (Tomasello *et al.* 2007), they invite anyone we interact with to see easily what we are looking at. By contrast, great apes have round, dark eyes, making it very difficult to judge their gaze direction.

2. *Intersubjectivity* – Our eyes are adapted for mutual mindreading, also called intersubjectivity; our closest primate relatives block this off. To look into each other's eyes, asking 'can you see what I see?' and 'are you thinking what I am thinking?' is completely natural to us from an early age (Tomasello and Rakoczy 2003).

3. *Mothers and others* – the most convincing account of how, when and why intersubjectivity and cooperative eyes evolved is given by Sarah Hrdy in her landmark book *Mothers and others* (2009). We do babysitting in all human societies, mothers being happy to hand over their offspring for others to look after temporarily. African hunter-gatherers deploy this collective form of childcare (Hewlett and Lamb 2005), indicating that it was routine in our heritage. In stark contrast, 'hyperpossessive' great

ape mothers – chimpanzees, bonobos, gorillas and orangutans – do not dare to let their babies go.

4. *Grandmothers, menopause and childhood* – Monkeys behave differently from apes, being prepared to leave a baby with a trusted relative. The key factor involved is exactly how closely related individuals are. Old World monkey mothers usually live with female relatives; great ape mothers rarely do. So, ape mothers have no one nearby whom they can trust sufficiently. This indicates something significant about the social conditions in which we evolved. Our foremothers must have been living close to trusted female relatives, the most reliable in the first place being a young mother's own mother. This 'grandmother hypothesis' has been used to explain our long postreproductive lifespans – the evolution of menopause (Hawkes, O'Connell, Blurton Jones, Alvarez, and Charnov 1998; Hawkes and Paine 2006; Voland, Chasiotis and Schiefenhövel, 2005).

Coevolving with grandmothers were children. Childhood is defined as the period after an infant is weaned and before the child has any permanent teeth (Bogin 2006). During that time, children need help with finding a diet they can process. This is where grandmother steps in, since she is able to assist the newly weaned child, while the mother can begin the cycle of having her next baby (Sear 2018; Sear and Mace 2008). In this way, in evolution mother's mother would have had a big impact on a child's survival and/or increased her daughter's fertility. This has resulted in the special characteristic of 'stacked' families among humans, where a mother has several dependent offspring at once (Hawkes and Paine 2006). With no one to help, other great ape mothers need very long intervals between births and breastfeeding until each offspring can become an independent juvenile. Apes have no supportive transition period of childhood, and juveniles suffer high mortality.

Hrdy (2009) argues multi-parental care shaped the evolution of our species' unique psychological nature. Cooperative childcare has to start with the mother-daughter relationship because it requires trust, enabling the mother to hand over her baby to a closely related female (as in the case of monkeys). But such bonding with grandchildren could quickly lead to the involvement of aunts, sisters, older daughters and other trusted relatives. Males as brothers may be involved in female childcare coalitions earlier than male mates (putative fathers). There are two reasons why grandmother strategies are unlikely to involve mother's sons in early stages. Firstly, sons will not necessarily have certainty of paternity (so their mothers will not have certainty); and secondly, males tend to have first reproduction at a later age than females, requiring a son's mother to live longer to have an effect.

From the moment when mothers allow others to hold their babies, says Hrdy, selection pressures for new kinds of mindreading are established. These give rise to novel responses – mutual gazing, babbling, kissfeeding and so forth – which enable this variegated triad of mum, baby and new helper to consolidate bonds while monitoring one another's intentions.

5. *Our huge brain volumes* – While a human and chimp mother have a fairly similar body weight, adult humans today have upwards of three times the brain volume of a

chimp (Isler and Van Schaik 2012). Brain tissue is very expensive in terms of energy requirements (Aiello and Key 2002; Aiello and Wheeler 1995; Foley and Lee 1991; Power and Aiello 1997). Doing the whole job by themselves, great ape mothers are constrained in the amount of energy they can provide to offspring and so apes cannot expand brains above what is known as a 'gray ceiling' at 600cc (Isler and Van Schaik 2012). Our ancestors smashed through this ceiling some 1.5-2 million years ago with the emergence of *Homo erectus*, who had brains more than twice the volume of chimps today. This tells us that cooperative childcare was already part of *Homo erectus* society, with concomitant features of evolving cooperative eyes and emergent intersubjectivity.

We can track the degree of egalitarianism among descendants of *Homo erectus*, by measuring brain sizes in these early humans, using the fossil record. Materially more energy was channelled to females and their offspring. This implies an inevitable gendering of the strategies that enabled this to happen. Male dominance and strategic control of females (cf. Foley and Gamble 2009) would have obstructed such unprecedented increases of brain size. Those populations where male dominance, sexual conflict and infanticide risks remained high were not our ancestors. Our forebears solved the problem of great ape male dominance, instead harnessing males into routine support of these extraordinarily large-brained offspring.

The few African fossils from 800–600,000 years ago have cranial capacities in the range of 1,200–1,300cc; that is, in the modern range, three times a chimpanzee volume. However, the steepest increase in cranial capacities occurs later – from ~300,000 years ago (de Miguel and Henneberg 2001: Figure 1). African fossils suggest that this last phase coincided with our speciation (see Hublin *et al.* 2017; Power, Sommer and Watts 2013: 42, Table 1; Watts 2014). It also appears consequent on a suite of behavioral changes in the period ~500–300,000 years ago, incorporating regular fire use/camp fire social organization, new technologies in lithics, meat procurement, and shelter (Brooks *et al.* 2018; Watts, Chazan and Wilkins 2016).

In sum, these aspects of our biology, life history, and evolved psychology – our intersubjectivity, our cooperative eyes, large brain size, and life history stages of grandmothering and childhood – could only have been favoured in social conditions of greater egalitarianism and reduced tendency to dominance.

Increasing Machiavellian intelligence produces egalitarian relations

Large increases of brain size are vanishingly rare in evolution because of the expense. What are these large brains for? One major hypothesis is the Social Brain theory. This relates brain size, specifically the size of the neocortex, across primate species, to the degree of social complexity, the network of relationships that any individual needs to deal with (Dunbar 1998). Originally, 'social brain' was called Machiavellian intelligence (Byrne and Whiten 1988). This subtle idea sees animals in complex social groups

competing in evolutionary terms by becoming more adept at cooperation and more capable of negotiating alliances. In this theoretical perspective, then, the significant increases of brain size in the primate order, from monkeys to apes, and then from apes to hominins, result from increasing political complexity and ability to create alliances.

Egalitarianism is difficult to explain using Darwinian theory premised on competition. Andrew Whiten, one of the inventors of Machiavellian intelligence theory and his student David Erdal saw that Machiavellian intelligence could generate the difference between primatestyle dominance hierarchies and typical hunter-gatherer egalitarianism (Erdal and Whiten 1994, 1996; Whiten and Erdal 2012). At a certain point, the ability to operate within alliances exceeds the ability of any single individual, no matter how strong, to dominate others. If the dominant tries, he (assuming 'he' for the moment) will meet an alliance in resistance who together can deal with him. Once that point is reached, the sensible strategy becomes not to try to dominate others, but to use alliances to resist being dominated oneself. This was termed 'counterdominance' by Erdal and Whiten (1994, 1996; Whiten and Erdal 2012), and they used it to describe what is found regularly in African hunter-gatherer societies, so-called demand-sharing, an attitude of 'don't mess with me' humour as a levelling device, with the impossibility of coercion since no particular individual is in charge.

Whiten and Erdal saw counterdominance as fundamental to the evolution of human psychology, with competing tendencies for individuals to try to get away with bigger shares where opportunity presents, but, faced with demands from others, to give in and settle for equal shares. They focused on food-sharing as the most visible aspect of hunter-gatherer egalitarianism. But how does sex fit into this model? From an evolutionary perspective, equality in reproductive fitness is most significant. Without concomitant reduction of reproductive variance, counterdominance could not be a stable strategy. Pawlowski and colleagues (1998: 361, Fig.1) show that increasing Machiavellian intelligence in monkeys and apes does indeed result in reproductive counterdominance. Bowles (2006) points to reproductive levelling among predominantly monogamous hunter-gatherers as critical to egalitarianism. Whiten and Erdal noted the hunter-gatherer tendency for monogamy, or serial monogamy, which contrasts with polygyny among propertied farmers and herders (cf. the Y-chromosome diversity collapse with onset of farming). Again our biology shows underlying features of reproductive physiology that lead to reproductive egalitarianism.

This suggests a further 'egalitarian' feature of our anatomy:

6. Women's sexual physiology – If a hominin female needs extra energy for her hungry offspring, better to give reproductive rewards to males who will hang around and do something useful for those offspring. Our reproductive signals make life hard for males who want to identify fertile females, monopolise the fertile moment and then move on to the next one – a classic strategy for dominant male apes (Power, Sommer and Watts 2013). We have concealed and unpredictable ovulation. A man cannot reliably tell when his partner is ovulating. Also, women are sexually receptive, potentially, for virtually all of their cycle, a much larger proportion than any other primate (Gangestad and

Thornhill 2008). The combined effect is to scramble the information for males about exactly when a female is fertile. For a dominant male controlling a harem of females this is disastrous. While he is guessing about the possible fertility of one cycling female, he has to stay with her, and is missing other opportunities. Meanwhile, other males will be attending to those other sexually receptive females. Continuous sexual receptivity spreads the reproductive opportunities around many males, hence is levelling from an evolutionary perspective (Marlowe and Berbesque 2012).

BaYaka women of the Congo forest have a chorus perfectly expressing their resistance to male philandering: 'One woman, one penis!' (Knight and Lewis 2017a: 440) This serves as their ritual rallying cry against any attempt by a man to form a harem. Basically, hunter-gatherer women demand one man each to support their energy requirements and investment in costly offspring.

Symbolic resistance to 'alpha' males

Women's bodies evolved over a million years to favour the 'one woman, one penis' principle, rewarding males who were willing to share and invest over those who competed for extra females, at the expense of investment. But as we became more Machiavellian in our strategies, so did would-be alpha males. The final steep rise in brain size up to the emergence of modern humans likely reflects an arms race of Machiavellian strategies between the sexes.

As brain sizes increased, mothers needed more regular and reliable contributions from male partners. In African hunter-gatherers this has become a fixed pattern known by anthropologists as 'bride-service' (Collier and Rosaldo 1981; Lee 1979; Woodburn 1968). A man's sexual access depends on his success in provisioning and surrendering on demand any game or honey he gets to the family of his bride – mainly his mother-in-law who is effectively his boss. Where women are living with their mothers, this makes it almost impossible for a man to dominate by controlling distribution of food (*contra* Foley and Gamble 2009; Seabright 2012).

The problem for early modern human females as they came under the maximum stress of increased brain size would be with males who tried to get away with sex without brideservice. To deal with this threat, mothers of costly offspring extended their alliances to include just about everyone against the potential alpha. Men who were relatives of mothers (brothers or mother's brothers) would support those females. In addition, men who willingly invested in offspring would have interests directly opposed to the would-be alpha, who undermined their reproductive efforts. This pits a whole community as a coalition against a would-be dominant individual. Evolutionary anthropologist Christopher Boehm describes this as 'reverse-dominance', a political dynamic that for the first time established a morally regulated community (Boehm 1999).

So the occasion for reverse-dominant, collective – *moral* – action happened whenever a prospective alpha male tried to abduct a potentially fertile female. Can we describe

this in more detail in terms of actual behaviour? The alpha male strategy is to find and mate with a fertile female, before moving on to the next one. But how does a male identify fertile females, considering that in human evolution ovulation became progressively concealed? One cue to the human reproductive cycle could not be so easily hidden: menstruation. With no sign for ovulation, menstruation became a highly salient cue to males that a female was near fertility.

For an alpha male, a menstruating female is the obvious target. Guard her and have sex with her until she is pregnant. Then, look for the next one. In nomadic hunter-gatherer camps, women of reproductive age are pregnant or nursing much of the time, making menstruation a relatively rare event. Undermining cooperative childcare, menstruation threatens to trigger male competition for access to an imminently fertile female, and also competition among females, because a pregnant or nursing mother risks losing male support to a cycling female.

Mothers have two possible responses to this problem. Following the logic of concealed ovulation, they might try to hide the menstruant's condition so that males would not know. But because the signal has potential economic value by attracting male attention, females are predicted to do the opposite: make a big display advertising imminent fertility. Whenever a coalition member menstruated, the whole coalition would join that female in amplifying her signal to attract males. Females within coalitions would begin to use blood-coloured substances as cosmetics to augment their signals. This is the Female Cosmetic Coalitions model of the origins of art and symbolic culture (Power 2009; Power, Sommer and Watts 2013).

In creating a cosmetic coalition in resistance, females deter alpha males by surrounding a menstrual female and refusing to let anyone near. They are creating the world's first taboo, on menstrual blood collectively imagined, speaking the world's first word: NO! To reinforce this message of refusal they would act out and perform through pantomime 'Wrong sex, wrong species' (Knight, Power and Watts 1995; Power and Watts 1997, 1999; Knight and Lewis 2017b).

But even as a negative, this cosmetic display encourages investor males who are willing to go hunting and bring back supplies to the whole female coalition. Cosmetically decorated females who create a show of solidarity against alpha males ensure that investor males will get the fitness rewards. It is fully in the interests of investor males to sexually select females belonging to ritual cosmetic coalitions, because they then eliminate competition from the would-be alphas.

The Female Cosmetic Coalitions (FCC) model shows us the prototype of a moral order, upheld through those puberty rituals, taboos, and prohibitions that surround menstruation in so many ethnographic accounts (Knight 1991). The FCC strategy is also the prototype symbolic action, with collective performative agreement that fake or imaginary 'blood' stands for real blood. While it is revolutionary at the level of morality, symbolism and economics, the strategy emerges as an *evolutionary* adaptation, driven by male sexual selection of female ritual participants. On this basis, through *re-*

verse gender dominance, the hunter-gatherer institution of bride-service emerges, with roughly equal chances of reproductive success for all hunters.

Finally, the FCC model explains what we find as the earliest symbolic material in the archaeological record. When the theory was first advanced in the mid-1990s (Knight, Power and Watts 1995), it predicted that the world's earliest symbolic media would consist of bloodred cosmetics. It predicted where and when we should find them: in Africa, preceding and during our speciation, in relation to the increases of brain size. This points to a pigment record no earlier than 6-700,000 years ago and especially coinciding with rapid growth of brains in the last 300,000 years.

These theoretical predictions have been strikingly confirmed. Pervading the record of the African Middle Stone Age are blood-red iron oxides: red ochres. These pigments are the first durable materials to be mined, processed, curated and used in design. They date back at least 300,000 years in the East (Brooks *et al.* 2018) and southern African record (Watts, Chazan and Wilkins 2016), possibly as old as half a million years. From the time of modern humans they are found in every southern African site and rock shelter. They become the hallmark of modern humans as they move out of Africa around the world, found in copious quantities in both the Upper Palaeolithic of Europe and in Australia from the first entry of modern humans to those continents.

Synchrony and the Moon

The model makes several predictions about the cosmology that emerged among early human hunter-gatherer communities deriving from the original ritual strategy. It expects that cosmology measures time through lunar and menstrual cyclicity.

There is a widespread 'myth' of menstrual synchrony that both Western and Indigenous women tenaciously cultivate as an expression of solidarity (Fahs 2016). Science remains skeptical of the phenomenon. Women have variable cycle lengths, both between individuals and as experienced by any one woman throughout her reproductive life. Today data is being gathered in large quantity through menstrual apps. Although this comes predominantly from women leading western lifestyles, it is still revealing. The more cycles that are averaged, the more that these are ovulatory cycles (hence fertile), the more the mean falls into the 29-30 day range. If women in their 20s, at peak fertility, are sampled, at the lower end of BMI range (better representative of women in evolutionary time), the closer the mean gets to 29.5 days – the length of the synodic lunar cycle (Bull *et al.* 2019). Pregnancy may also show a mean length nine times this (Jukic *et al.* 2013; Martin 1992: 263-64, 2013: 82, 95; Power and Aiello 1997: 160). In a recent analysis of over 4100 menstrual onsets among rural German women with longterm menstrual records, Helfrich-Förster and colleagues (2021) showed a 29.4 day mean cycle length for women under 35 years and a significant clustering of menstrual onset at either New or Full Moon, compared with 1st and 3rd quarters.

The excellent night-vision of big cats and other carnivores suggests moonlight periodicity would have had important impacts on hominin evolutionary ecology, stretching back millions of years in Africa before any symbolic culture. Lions hunt at night when there is no visible Moon, giving them night-vision advantage (Joubert and Joubert 1997). Still today, in Tanzania, the record of humans being eaten by lions is lunar-phased (Packer *et al.* 2011). So there are material reasons for an ancient lunar-phase effect on human social and reproductive life.

If the evolutionary effect of synchronising menstruation is understood in terms of synchronising ovulation, then we find a further mechanism for reproductive egalitarianism. Where a coalition of women synchronise ovulation, it is difficult for any single male to monopolise fertile matings. Synchrony operates to undermine philanderer strategies by males; it reinforces 'one woman, one penis'.

In a traditional bush camp of nomadic Ju/'hoansi or Hadza hunter-gatherers of perhaps 30 individuals, only two or three women or girls (depending how many local young women) are likely to be cycling at any time. So, it is remarkable that evidence in ethnography (Buckley 1988), myth (Knight 1983), rock art (Garlake 1995, Knight 1991: 446), games (Knight 1991: 445) and ritual practice (Power 2015) points to the same finding – women use idioms of bleeding together to express connection and belonging.

Science may not be able to demonstrate the existence of physiological menstrual synchrony. But ritualised or cultural menstrual synchrony certainly exists in societies whose lifeways most resemble those of our ancestors. And it is an expression of power. Ancient rock art in Africa, Australia and Europe portrays pairs of females linked by epic menstrual flows (Garlake 1995; Knight 1991; Power 2004); mythology of these hunter-gatherers obsesses over the taboo powers and cosmic creativity of girls in menstrual seclusion (Power and Watts 1997). Ritual practices enact dramas of a Dreaming or First Creation where women bleed together (Keeney and Keeney 2013), using red pigmented cosmetics (Power 2004; Watts 1999) to simulate it. Women's menstrual observances govern success in hunting (Lewis 2008).

The original sex-strike model outlined in Chris Knight's *Blood Relations* (1991) argues that human culture was born in a revolution when women went on strike. Women with their kin, sons and brothers, would celebrate ritually at Dark Moon, signalled by menstrual blood (real or fake); as the Moon waxed and the night sky brightened, men would go hunting for large game, bringing back kills to their wives' camp for the Full Moon feast, when all taboos on marital sex and meat were relaxed. At the next Dark Moon, women would go on sex-strike again to keep the cosmos turning. This syntax – waxing vs. waning, raw vs. cooked, fast vs. feast, blood vs. fire, kinship vs. marriage – persists at the core of all magical myths, fairytales and ritually derived narrative dramas (Cardigos 1996; Knight 1987, 1997; Power 2011; Power and Watts 1997; Watts 2005).

Men were not the first to imagine menstruation as a symbol of solidarity and ritual power; myths themselves repeatedly claim that men 'stole the secrets' from women. Knight (1991: 374-416) realised that menstruation must have been the original signal

of 'sex-strike' and taboo. In a strike, everyone needs to strike together, and the obvious clock to use would be the Moon. Add to this that hunters require moonlight to hunt or travel overnight and the initial waxing Moon/waning Moon model alternating kinship with marital relations fits together (Knight 1991: 414-415).

African hunter-gatherer lunar cosmology

How a society organises time reveals what it truly values. The earliest human economy operated on an alternation of women's availability and non-availability, in line with the Moon and menstruation. African hunter-gatherer cosmology takes the lunar cycle as the crucial timeframe for ritual, sex and economic activities. The shared sources of this cosmology carry us back to earliest human symbolic culture, the very origins of art and ritual itself, over 100,000 years ago (Power 2017).

The special emphasis on African foragers arises because these peoples bear the oldest and most genetically diverse lineages of humanity (Chan *et al.* 2015; Power 2017 and see refs). The model specifies a 'time-resistant' signature of ritual power. It delineates an initial situation of ritual, art and religion: what 'God' or sacred power first looked like. From that point over 100,000 years ago among proto-Khoesan big-game hunters, there have been many historic changes in modes of subsistence as modern human populations moved around the world. Even among foragers, hunting strategies have changed to become more privatised than collective (e.g. use of bows and arrow poison where previously a group of men might cooperate with spears, d'Errico *et al.* 2012; Lombard 2020). Therefore, we may not see in real economic life of people today the exact lunar periodic hunting cycle in relation to female menstrual cycles. But what we expect is that there should be remnant beliefs and taboos relating women's cycles to the Moon, and to men's hunting success. We also expect that ritual practice in relation to boys' and girls' initiation will echo the ancient signal (bloodflow plus wrong sex/species reversal).

Hunting, menstruation and the Moon: the Hadza

Besides critical effects on prey-predator interactions, the Moon and its phases underpin symbolism. For example, a Kalahari Ju/'hoan metaphor for a lion is 'moonless night' (Biesele 1993: 24). Hadza hunters of the Tanzanian rift valley also pay careful attention to the Moon (Power 2015). A Hadza man will *not* go hunting, but lions will go hunting at the time of *Epeme*, when no Moon is in the sky. Hadza cosmology envisions an alternating shift between lion and human hunters.

Taboo structures among the Hadza suggest an ideal template of the relationship of hunting, menstruation and the Moon, mitigated by arrow poison (Power 2015). A wife's menstruation prevents her husband from hunting – because her blood is believed to destroy arrow poison (Peterson 2013: 148; Woodburn 1982a: 188; cf. Biesele 1993:

93, 196 for Ju/'hoansi). In addition, she and her husband cannot have sex and she should not gather berries, in case they all fall down and spoil, nor gather honey (or it would dry). Woodburn (1964: 274-276) describes the regular observance of restrictions relating a wife's menses/pregnancy to a man's hunting as the 'confirmation of their marital status'. Skaanes (2017a) records an idea that if weapons are touched by a menstrual girl, their 'thirst' for blood will be assuaged and they will not work on animals. Women's blood is hence equated with animal blood (cf. Knight and Lewis 2017b).

Hadza adults will agree or assert women have a relationship to the Moon (Power 2015). But there are differing answers to 'when do women menstruate in the Moon?' Two seniors – a man and a woman – independently argued that women would menstruate together and named the dark of the Moon. Women still having menstrual cycles dispute that, probably reflecting their own variable experience. But they reconcile these different views by agreeing 'it used to be like that in the old days'. Both Dorothea Bleek (1930: 700) and James Woodburn (pers. comm. 1993) heard this belief in women's synchronisation of menstruation at Dark/New Moon.

In recent research, Katherine Fitzpatrick (2018: 129) found that 'Hadza women appear to constantly monitor the waxing and waning of the moon as well as its position in the sky'. One informant told her: 'I look at the moon every day. The moon says if I am going to or not going to menstruate'. Some women mentioned 'after the moonlight disappeared' in reference to timing. This now gives us a fourth independent ethnographer documenting Hadza women's association of menses to the Moon and specifically to Dark Moon: Bleek in 1930, Woodburn from the 1960s, Power in 2003-2004 and Fitzpatrick most recently, covering the best part of a century.

A senior *epeme* man also spelled out in digital on/off terms how the Moon itself affected arrow poison (Power 2015; cf. Bleek and Lloyd 1911: 67, 77, for the /Xam; Power and Watts 1999: 1123). He related this to the topography of a camp in Yaeda Valley that has a rock wall horizon behind which the young Moon sets. He calibrated the efficacy of arrow poison in terms of the hour at which the Moon set: very early in the evening, when the Moon was small, the poison would not work; later, as the Moon waxed and set after nine o'clock, it would be fine.

If women really did synchronise their cycles, this would give a template (Figure 1) with three different idioms ruling out effective hunting in the early new Moon: because women themselves affect arrow poison; because the Moon does; or because of the danger of lions.

][Figure 1. Lunar template framing Epeme, hunting and menstruation.

A man who went hunting when his wife was menstrual would likely be eaten by those lions which can see so well. At waxing to Full Moon, good moonlight favours hunting, in particular the successful waterhole ambush technique in late dry season (Bunn *et al.* 1988: 424; Hawkes *et al.* 1991: Table 2; Marlowe 2010: 118–119; Peterson 2013: 35; Woodburn 1964: 49; and see Watts this volume).

The lunar template

Hadza society in traditional bush camps is powerfully organised by moonlight and darkness. The major ritual celebration of the Hadza is the *Epeme* dance, held in pitch darkness for two or three nights every month around the time of Dark Moon (Power 2015). Traditionally, most camps hold an *Epeme*, the period of dry-season aggregation being most favourable for the ceremony. But even in the wet season, an *Epeme* would be danced each Dark Moon somewhere in Hadza country. The ritual requires several adult women providing the accompaniment of special polyphonic *epeme* songs. I have been in *Epeme* ceremonies ranging from three to four women singers, up to 15 or more, each with its own special atmosphere. The key feature is gender segregation with women and older girls comprising one group, sitting apart from and out of sight of the group of initiated *epeme* men.

The lunar phase of darkness is emphasized by the extinguishing of fires; everybody complies, raising a hue and cry if any light shows. Initiated men dance, one after another, embodying the 'spirit' *Epeme* or as the 'shadow' of *Epeme*, with a costume of dark cloth, shining ostrichfeather head-dresses (*kembako*), leg-bells (*!ingiribe*) and a gourd rattle (*sengeno*). As the singing grows strong, moved by joy and emotion, women get up to dance around the shadowy figure who stamps down with a special step on his right foot, the bells jingling in time with his rattle. Skaanes (2017b: 209, 212) relates this sound to the tendon-clicking of heavy eland antelope bulls as they trot.

With spirited singing, the mood under the panoply of the Milky Way is ethereal and uplifting. Failure to hold the dance, says Woodburn 'is believed to be dangerous' (1982a: 190). *Epeme* promotes and maintains 'general well-being, above all good health and successful hunting'. Peterson (2013: 162) describes the aspect of community harmony, uniting men as a group with women as a group: 'harmony-breaking illness can be cured at the *epeme* dance'. This refers especially to illness arising from *epeme* violations.

The *Epeme* dance, says Woodburn, 'stresses kinship and joint parentage, and seeks to reconcile the opposed interests of men and women which are so manifest in other contexts' (Woodburn 1982a: 190). A man may dance in the guise of *Epeme* two or three times, each dance being for someone. First, he may dance for himself; then, most commonly for one of his children – either an actual child or an object owned by his wife that stands for a child. This may be a decorated gourd in which fat is kept, or a stone or clay decorated 'doll'. A man may also dance for other close kin or affines. At each dance, a dialogue is held between the *epeme* dancer and the women. The dancer uses a ritual 'whistling' language special to the context, the women answering with greetings, using the kinship term applicable to the person for whom that dance has been held (Woodburn 1982a: 190).

`][Figure 2. Hadza dances in the dry river at Sekobe by full moonlight (photo by author).`

At the Full Moon, Hadza men and women, youths and girls will join a joyful party of songs and dances, with no restrictions on who sings or dances together, held in

some clear space like a dry sandy riverbed (Figure 2). While *Epeme* is sacred, intense and emotional, at the Full Moon people really relax and enjoy themselves. Oscillation through the lunar cycle between relations structured by kinship (Dark Moon) and then relaxation of restrictions or taboos (Full Moon) corresponds to the model of ritual lunar periodicity (Knight 1991: 414, 1997: 135-6; Knight, Power and Watts 1995: 83, 91) here described as a 'time-resistant syntax'.

Bushman and Forest hunter-gatherer traditions

Lunar cosmology is widespread in Khoesan traditions from southern Africa (Barnard 1988; Guenther 1999; Hahn 1881; Schapera 1930; Watts 2005). A story found among almost all Khoesan groups, the *Moon and Hare,* relates the origins of death (Barnard 1992: 83; Guenther 1999); among several Bushman groups, the waning Moon is linked to spirits of the dead, the New Moon to new life (Barnard 1992: 56; Guenther 1999: 65; Hewitt 1986: 42; Watts 2005). Such potent entities as Trickster and Eland are identifiably lunar – they grow large, fade away, come back alive (Power and Watts 1997). Moon phases – notably the appearance of New Moon – schedule menarcheal ritual and prayers for hunting luck and have the power of cooling arrow poison, just as with the Hadza. While the New/waxing Moon is associated with hunger and hunting, the fat Full Moon signifies repletion and feasting (Watts 2005). The time of hunger is linked among the !Xũ to menarche at Dark Moon when camp fires are extinguished (Watts 2017: 259, citing Viegas Guerreiro).

For the Hadza, the 'Moon is brother to all women'. This compares to Nharo Bushman lore: 'he doesn't like the boys, just the girls' (Guenther 1989: 52). For the Western Pygmy BaYaka, 'women's biggest husband is the moon' (Lewis 2008: 299). When the *Malobe* ritual is called on a night of no Moon, it leads to a special intense and aesthetic experience (Lewis 2002: 150– 151). Just as at *Epeme*, campfires are extinguished so the singing group, again largely women, sit in complete moonless dark; they may hold 'mystical conversations' with the Moon; their singing lures luminescent forest spirits to dance around them. These spiritis, as at *Epeme*, are secretly engendered by male initiates. Recurrently among these African hunting cultures we find links between Dark Moon, menstruation, hunger and extinction of cooking fire (Power 2017). Again this conforms to Knight's time-resistant syntax.

Lunarchy in action

Contrary to presumed Neolithic gender relations, these hunter-gatherer societies are among the most gender egalitarian on earth (Finnegan 2013, 2017; Power 2015). But how does such egalitarianism work? Initiation ritual is vital to cultural transmission among huntergatherers: it is the means by which culture is passed down the generations and maintains continuity. Initiation is therefore expected to be extraordinarily

conservative, preserving with fidelity archaic signals of ritual power. Myth and ritual of initiation (for both girls and boys) among Khoesan (southern Africa) groups, can be compared with those among the Hadza (Tanzania) revealing 'wrong sex/species' reversal motifs in connection to menstruation and the Moon. The dynamic of initiation, as recapitulation of early ritual strategies, should be of *reverse gender dominance.*

The ethnography of immediate-return African hunter-gatherers, including Khoesan, Pygmies and Hadza, provides many examples of women defying potentially dominant males by forming intergenerational ritual coalitions. These foster intense female solidarity, both for resisting harassment and actively motivating male hunting (Bombjaková 2018; Finnegan 2013; Knight 1991; Lewis 2002, 2008; Power 2015; Power and Watts 1997, 1999).

When hunter-gatherer women mobilise their community, their reverse dominance performances apply leverage by temporarily withdrawing from sex, but at the same time performing collectively, publicly and erotically. Morna Finnegan (2013) describes this as the 'politics of eros'. Women's body language as a public group actively disrupts sex presently while motivating men with the prospect of future reward.

A girl's first menstruation ritual among various northern, central and southern Khoesan groups, known as the Eland Bull dance, is so widespread that it is likely to be very ancient (Lewis-Williams 1981; Power and Watts 1997). The girl herself is conceived as constantly transforming, changing her identity from female to male, human to animal (Keeney and Keeney 2013), and the ritual observances, including sharing of haematite (a form of red ochre), must control and distribute this potency (Power and Watts 1997). Metamorphosed into the Eland Bull, while under stringent taboos and seclusion, the girl is now clearly unavailable to any man – she is of the wrong sex, species, and time. The women's community celebrates by dancing around the metamorphosing girl, playfully – and erotically – mimicking behavior of mating elands. This gives a clear signal they are not available for sex with their human husbands.

A lunar schedule is implicated in this ritual. The Ju/'hoansi speak of menstruation as a sickness, sometimes called 'eland sickness', but often attributed to the Moon. 'The Moon torments me' is to have menstrual cramps (Biesele 1993: 93). Among the Nharo, 'Moon medicine' is used to treat menstrual discomfort (Barnard 1979). Significantly, among widespread groups, the /Xam, the !Xu and the G/wi and G//ana, the menarcheal girl was released from seclusion at the appearance of New Moon (Bleek 1928: 122; Lloyd n.d: 4001-4002; Valiente Noailles 1993: 94-97). The maiden in her 'sickness' and emergence dies and is reborn to wax fat with the Moon. Maiden, eland bull and the Moon fatten together.

While elder male healers and grandfathers may be involved as eland dancers (e.g. among Ju/'hoansi or Nharo), women alone may hold the horns in the Eland dance, as witnessed by Valiente-Noailles (1993) with the 'Kua' (G/wi or G//ana). There women dance around the menstrual seclusion hut using sticks as horns to keep men at a respectful distance. This picture of disarmed or immobilised hunters on the receiving

end of sticks wielded by women compares with the pattern among Hadza *Maitoko* girls or Mbuti *Elima* girls.

Among the East African Hadza, the girls' initiation ritual *Maitoko* involves similar sexual defiance (Power 2015). Dressed as hunters and armed with sticks, *Maitoko* initiates chase young men in a dramatic reversal of gender roles. Much joking, teasing, provocative flirting and taunting ensues as the disarmed boys try to disarm the girls of their weapons (Figure 3).

]`[Figure 3. Reverse dominance in action: Hadza <em>Maitoko</em> girls battle older boys at Omboi camp (photo by author).`

In the Central African forests, gender reversal plays a key role in maintaining gender egalitarianism. Among the Mbuti in the east, the girls' initiation *Elima* involves girls becoming 'hunters' and chasing young men with sticks in a manner extremely similar to the Hadza (Turnbull 1960). At first menstruation, 'blessed by the moon', girls would enter the *elima* house residing for one or two Moons in 'seclusion' with their friends and older women who taught them songs. Periodically, the *elima* girls would march, painted, out of the house to chase the boys in the forest, armed with long, thin *fito* whips (Turnbull 1960: 183, 1984: 171). Aggressive targeting of the boyfriends they fancied increased towards the end of the seclusion period and climaxed in an all-out battle between *Elima,* the female initiation group*,* and *Molimo*, the male initiation group (Turnbull 1957: 208). Again, the Hadza have a similar climactic battle of youths and girls over a pot of food, representing the original *epeme* meat.

Mbuti youths who had been hit on by the girls were meant to fight their way to a date in the *elima* house, running the gauntlet of a vigilant guard of women grouped around it and a defence force of 'between fifteen and twenty girls armed with long whips' (Turnbull 1960: 188). If the women had any objections to a candidate they were more than able to stop him: 'I have known them to throw a brave but unwanted suitor into the river after beating him soundly' (Turnbull 1960: 188). Turnbull (1960: 185) also records public performance of 'a number of swearing and sex songs, and erotic dances' by *elima* girls.

This erotic license recalls the obscene songs of the Western Yaka *ngoku* groups (Finnegan 2013; Lewis 2002). During *Ngoku*, women initiates of all ages storm into the central area of the camp and assume riotous control. They sing beautifully but rudely and defiantly, taunting men for their sexual ineptitude. *Ngoku*, conceptualised as women's communal spirit, acts out the mythic theme of a primordial time when women lived without men and possessed the spirit *Ejengi.* Older women and demure young girls adopt mock penises and aggressive male postures, imitating male misbehaviour in sexual intercourse.

Ngoku teaches young women how to control men by acting together in solidarity, periodically refusing sex while simultaneously arousing desire. Women's reverse dominance displays are answered by men in a corresponding ritual show of strength, known as *Ejengi.* Accepting that the potential for male violence is real, Finnegan argues that this very fact explains why 'the perpetual motion against dominance must be con-

tinually reinvented' (Finnegan 2008: 137). BaYaka men use *Ejengi* to remind all of their greater physical strength. Women's countervailing solidarity is mobilised by this provocation. So effectively do women inhibit male aggression using *Ngoku* that the community collapses into song, ribald laughter and erotic play. The outcome is what Finnegan (2008: 218) terms 'communism in motion' – a swing between gendered poles of power and their celebratory overturn; between brute force on the one hand and female collectivised seductiveness (while mimicking male anatomy) on the other. Crucially, these maxima and minima of reverse gender dominance during ritual generate time outside ritual with relatively relaxed gender egalitarianism and counterdominance between men and women (Lewis 2014). Again, this resembles the waxing/waning logic of the Knight model. Finnegan (2013: 699) stresses the 'fizzing' of women's singing and dancing, as a vital alert flow, able to launch into action at any moment necessary, 'visceral, kinetic, erotic, live'.

][Figure 4. Reverse dominance: Hadza Maitoko girls, armed and ready for action at Kideru (photo by Chris Knight, with permission).

Women especially assert power through collective bodily performance to resist any threat of male exploitation. We see here the gender aspect of the assertive egalitarianism as understood by James Woodburn (1982b). Equality is never taken for granted but vigilantly guarded: 'actions speak loudly: equality is repeatedly acted out, publicly demonstrated, in opposition to possible inequality' (Woodburn 1982b: 432). The ritual dramas of initiation for both sexes propel the swing of a 'pendulum of power' now with one sex, now with the other, as visualised by Finnegan (2013, 2015; and see Lewis 2002, Lewis 2014: 237). Only by maintaining this movement can any fixity of hierarchy be resisted.

Both collective ritual performances of Hadza women in their different ways, *Maitoko* and *Epeme,* are examples of this 'bodily counter-power', as Finnegan (2008: 228) calls it, in response to the threat of male control or dominance, because 'absence of hierarchy in this moment is no guarantee of its absence in the next' (Figure 4). While referring to Mbendjele situations, Finnegan's remarks apply strongly to the Hadza: 'it is the possibility of concerted male violence in any inter-sexual negotiation that makes women's collective responses so profoundly serious'. (Finnegan 2008: 141)

As the Moon waxes and wanes, the dynamic of power switches in more or less playful battles between the sexes. The Moon provides the concrete timeframe for women's ritual expression of menstrual solidarity. Rather than patriarchy or matriarchy, we observe lunarchy – rule by the Moon.

This pulse of waxing and waning, ritual power ON, ritual power OFF, is expressed in very ancient concepts of hunter-gatherer religion. The Khoesan trickster, in his – or rather 'their' since a gender fluid pronoun is decidedly appropriate – multifarious guises (Guenther 1999), can be seen as an embodiment of this oscillatory logic of lunarchy. In certain narratives we find a strong periodic function of gender antagonism and egalitarianism, for example, in the comic trick/counter-trick story of Kaoxa from the Ju/'hoansi (Biesele 1993: 171-185). There is stark contrast between trickster's awesome

powers as guardian of menstrual maidens or game animals, seen in ritual practice, as against the mean, cheating, deceiving comedy fool of story. This reflects the structural opposition of ritual taboo during waxing Moon, giving way to lifting of taboos during waning Moon, as people relaxed and told tales.

A retelling of the story of /Xam trickster /Kaggen's creation of both the eland and the Moon from an old shoe (Bennun 2004: 57-65) reveals two typical aspects of trickster lore. First a motif of reversal: /Kaggen fights the meerkats who have killed his beautiful eland, by trying to fire off arrows, but they stop, turn around and come straight back at him. Motion goes into reverse. Second, /Kaggen escapes his tormentors when, finding an eland's gall bladder, he pierces it to create total darkness bringing the day to an end. Not able to see, he throws the old shoe up into the sky to become the New Moon, giving light to the hunt. The trickster's lunarchic powers control time itself, sending it into reverse, stopping and starting at each switch of lunar phase.

The remarkable ethnography of the Keeneys (2013) working with Nyae Nyae Ju/'hoan healers has revealed the recursive frame of healing, girl's first menstruation and boy's first-kill as seeking re-entry to First Creation – original time 'before time and place' when nothing was named or fixed in form, everything kept changing, there was no death or sickness, and people had 'eland heads'. Trickster, inhabiting the western sky (as the New Moon and spirits of the dead), is gatekeeper of this inchoate world in perpetual flux, 'central denizen of the First Order of existence' according to Guenther (1999: 96).

Trickster is this oscillation switching energy between First and Second creation; from antistructure to structure; reverse gender to biological sex; waxing to waning; blood taboo to lifting of taboo. As people come back out of the rapid, emotional transformations of ritual experiences where trickster is intense, powerful and cosmic, they laugh with relief, chatter and tell each other what happened in the weird, fantastical world. Now, trickster becomes the butt of all jokes.

Conclusion

Lionel Sims (2006) has argued that Stonehenge was a stage for a shifting balance of gender power towards masculinisation of ritual and new forms of esoteric knowledge. He demonstrates in great detail how the winter setting Sun annexed the former religious significance of the Dark Moon. This chapter has explored how that lunar syntax of ritual power first emerged.

The human symbolic revolution was the culmination of an evolutionary process of increasing tendency to gender egalitarianism among African modern human ancestors. The first symbolically structured division of labour emerged through reverse gender dominance. Female cosmetic coalitions resisted alpha males who refused to do bride-service by periodic ritual performance signaling sexual refusal through collective menstrual bloodflow. A lunar/ menstrual cosmology organised the first human 'eco-

nomics of time', with oscillation between waxing phase of ritual taboo and production followed by waning phase of taboos relaxed and consumption of flesh (of both women and animals). A lunar syntax of ritual power has persisted to this day in patriarchal religion, mythology, narrative and drama.

When no one rules but the Moon, it instills balance of power and time. As humans evolved under the sway of the Moon, our ancestors created the revolution which worked – the symbolic revolution, a realm of trickery and deception where everyone entered equally into the fantasy. It worked because no one held power forever; it kept ebbing and flowing, between the phases of the Moon, between the sexes and genders, between parents and children, between kin and in laws. The trick was to shed blood together in time with the Moon and the animals while being simultaneously female AND male. Initiation ritual of African hunter-gatherers preserves this logic of reverse gender dominance under auspices of the trickster.

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