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Zimbabwe.

Prof. Jephias Mapuva

Bindura University of Science Education,
Department of Geography (Development Studies),
Bindura,
Zimbabwe.

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Full Length Research Paper

The first track of cultural astronomy in Uganda: Perspectives of the Baganda, Bagisu, Banyoro and Langi

Bosco Oruru^{1*}, Harriet Najjemba², Annet Eva Zawedde¹, Ronald Nteziyaremye¹, Merciline Nayibinga¹ and Florence Mutonyi D'ujanga¹

¹Department of Physics, College of Natural Sciences, Makerere University, P. O. Box 7062, Kampala, Uganda.

²Institute of Open Distance and eLearning, College of Education and External Studies, Makerere University, Uganda.

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Uganda is among the most developing countries in Africa where astronomy education and outreach activities are at infant stages. Although Uganda has a long history of organized ethnic groups and cultures, record of cultural astronomy or its exploration is scanty, a challenge that this paper tries to address. A qualitative research design was adopted with emphasis on holistic description of primary data or information. Four ethnic groups, sampled from Central, Eastern, Northern and Western Uganda were explored, for which data were collected using questionnaires and interview guides. Most of the respondents were purposively sampled or hand-picked because they were either informative or had required characteristics. The commonly known visible celestial objects are the sun, moon and stars, all considered unique in characteristics. The moon and stars are believed to influence weather changes and socio-economic activities. The majority of stars are known to be smaller and very far away, with the bigger stars having names. The picture of a human being is famously recognized on the face of the moon. The ethnic groups still believe that the earth is flat and the sky is round with a diameter equal to the length of the earth.

Key words: Astronomy, ethnic groups, celestial objects, constellations, local names, myths.

INTRODUCTION

The mission of the International Astronomical Union (IAU) is to promote and safeguard the science of astronomy in all its aspects (Chapman et al., 2015). On a dark-clear night, at a distance far from city lights, the sky can be seen in all its splendour (Karttunen et al., 2017). It is interesting to understand how the many lights in the sky have affected people throughout the ages, from using

them to track the different seasons to relying on them to navigate thousands of miles on the open ocean, as well as timekeeping and noting fertility cycles (Karttunen et al., 2017; Ghosh, 2019; Urama and Holbrook, 2009). The ancient people saw figures traced by objects in the night sky that were related to religious myths and omens sent by the gods. However, a couple of millennia ago saw the

*Corresponding author. E-mail: bc.oruru@gmail.com; bcoruru@cns.mak.ac.ug.

real astronomy starting to evolve, separating itself from religions and astrological superstitions (Karttunen et al., 2017).

Astronomy is basically the study of celestial bodies, and it regards the subject of where and when a celestial body can be observed. According to Campion (1997), cultural or traditional astronomy is the use of astronomical knowledge and beliefs so as to inspire and inform social forms and ideologies.

African cultural astronomy is rich with mythical figures and divination methods that utilize observations of celestial bodies, and many other sky-related beliefs and traditions (Urama and Holbrook, 2009). It is entwined with religious beliefs and practices, agriculture, folklore, and social hierarchies (Holbrook, 2007; Urama and Holbrook, 2009). The Egyptians associated Sirius with the goddess Isis, and used its location to predict the annual flooding of the Nile (Ghosh, 2019). According to Urama and Holbrook (2009), one of the greatest challenges of most African astronomers today is being able to make local African world views more scientific, to link them to other world views, and to demystify the mysterious heavenly bodies of antiquity. The authors state that one of the strategies for trying to bridge the gap between traditional and modern astronomy is to reinterpret myths using the scientific lens of modern astronomy. This can show that scientific reasoning is not something new and not divorced from our life and culture. Uganda, the Pearl of Africa, is located in East Africa and lies across the equator (Sejjaaka, 2004; UBOS, 2006). From "The 2002 Uganda National Population and Housing Census Report" (UBOS, 2006), the country is about 800 km inland of Indian Ocean. It lies between 1° 29' South and 4° 12' North latitude, and 29° 34' East and 35° 0' East longitude. In addition, Uganda is a landlocked country, bordered by Kenya in the east, South Sudan in the north, Democratic Republic of Congo in the west, Tanzania in the south, and Rwanda in south-west. Figure 1 shows the map of Uganda and its position in Africa. Uganda has an area of about 241,038 km².

Classic Africa Safaris (2020) notes that the inhabitants of the present day Uganda were hunters and gatherers, until about 1700-2300 years ago when the Bantu-speaking populations from Central and Western Africa migrated into the south of the country, with iron-working, and social and political organization skills. In about 120 A. D., the Nilotic people who were cattle keepers and subsistence farmers entered Uganda from the north (Classic Africa Safaris, 2020). According to Amone (2015), Uganda has about 56 ethnic groups, the largest being the Baganda who occupy the northern shores of Lake Victoria. All cities and towns of Uganda as well as state institutions are known for high levels of heterogeneity and the country's politics has been a reflection of its ethnic plurality (Amone, 2015; Ricart-Huguet and Green, 2018; Government of Uganda, 2005).

This makes Uganda fit within the context of East Africa, which is a multicultural region with diverse ethnic composition and comprises a number of independent states (Kasujja et al., 2014).

Following from Sasso Uganda Safaris (2020), the cultural groups in Uganda, at the time of colonialism, could conveniently be divided into four broad linguistic categories namely; the Bantu, Luo, Ateker and Sudanic. The Bantu constitute over 50 percent of Uganda's total population and comprise; Baganda, Banyankore, Banyoro, Bakonzo, Basoga, Bakiga, Bafumbira, Batooro, Bamba, Batwa, Banyole, Basamia, and Baggwere. They generally occupy the east, central, west, and southern Uganda. The Ateker people, also called Para-nilotics or Nilohamites, are found mainly in the north, east and north-eastern Uganda. These comprise the Langi, Karamojong, Iteso, Kakwa, and Kumam. The group traces its origin in Ethiopia and is said to have been one people. The Langi are unique in that they lost their Ateker language and culture and resorted to Luo. The Luo is, however, an extensive family that spread all over East Africa. The Luo group in Uganda includes the Alur, Acholi, and Japadhola. The Alur are settled in West Nile, Acholi in Northern Uganda, and Japadhola in Eastern Uganda. The Sudanic people are speakers of West Nile languages, comprising; the Madi, Lugbara, Okebu, Bari, and Metu. They trace their origin in Sudan but their cultures and language indicate that they have become completely detached from their places of origin. The cultural groups reported in this paper are; Baganda, Bagisu, Banyoro, and Langi.

Uganda is among the most developing countries in Africa where Astronomy education and outreach activities are at infant stages, and perhaps not prioritized. This paints a bad image of Uganda, given that cosmogony mythologies of many ethnic nationalities of Africa show that Astronomy, among the sciences, has the deepest cultural roots. On 28th May, 2019, Hayley Roberts (a PhD student from Australian National University), on a yearlong data collection visit to Kibale National Park in Western Uganda, pointed out that his local field assistants from Kyanyawara area have never had a chance to see any astronomical objects through a telescope. To date, there is scanty or no record of Cultural Astronomy in Uganda. This is embarrassing given that Uganda has a long history of organized ethnic groups and cultures, and that there is a growing number of professional astronomers in the country, and Modern Astronomy teaching and research are ongoing in a number of universities. This challenge propelled the study leading to the content of this paper. During data collection process, it was evident that most Ugandans crave for telescope observations of the moon and stars, and the scientific explanation of what they see from time to time. It is hoped that this study will be supplemented by an outreach programme that will bring relief to members of



Figure 1. Map of Uganda showing neighbouring countries, and distribution of ethnic groups. Inset is position of Uganda in Africa (Ricart-Huguet and Green, 2018).

the indigenous population.

MATERIALS AND METHODS

It was appropriate to identify prominent planets, stars, constellations, and other celestial objects that may be of public interest, and this was achieved by the use of star map (Ghosh, 2019) and interactive star charts that provided whole lots of stars

and planets visible in a given month or season. The brightest planets, stars and constellations were purposively sampled for the study. There are about eighty-eight stellar constellations (Koontz, 2002; Ghosh, 2019), and at least twenty are clearly visible and contain very bright guiding stars.

A qualitative research design was adopted and emphasis is on holistic description of primary data or information. This mostly employed ethnographic research design, to explore the four ethnic groups, sampled from Central, Eastern, Northern and Western

Table 1. Sample size used in the data collection campaign.

| Ethnic group | Contacted | Responses | Comment |
|--------------|-----------|-----------|--------------|
| Baganda | 200 | 177 | Above target |
| Bagisu | 94 | 88 | Good |
| Banyoro | 97 | 92 | Good |
| Langi | 125 | 110 | Above target |

Uganda, respectively, in order to understand, describe and interpret their perspectives of celestial objects. This was an exploratory research with unknown variables, so only context was required.

The study also employed both probability sampling and non-probability sampling. In probability sampling, clustering was considered, where each cluster comprised a homogeneous unit or ethnic group. In non-probability sampling, the respondents were purposively chosen because they were either informative or had required characteristics, that is, the respondents with relevant information were hand-picked. In addition, snow-ball sampling was used, where key informants were asked to nominate other people who could be contacted for the information desired. Being the first of its kind, the study considered to contact 100 members of each ethnic group for responses. These comprised 30% women and 70% men, aged 25 years and above. The motivation to have more men was based on the fact that men are usually members of a given ethnic group right from the time they are born, but women may join from other ethnic groups because of intermarriages. Table 1 gives a summary of targets realized during the implementation. The Baganda received the lion's share because of proximity.

The data collection methods and instruments employed were mainly interviews (interview guides) and questionnaire survey (questionnaires). During the interviews, the respondents were orally questioned either individually or in groups, and their responses recorded during or after the interviews. In questionnaire survey, written questions were presented to respondents to answer in written form, the respondents either being gathered in one place, or contacted via email with clear instructions to fill the questionnaires. Demographic information was obtained from respondents, which included: gender, age, occupation, religion, ethnicity, and place of origin, among others. The respondents identified themselves with Anglican, Catholic, Islamic, and Born Again faiths. Most of the respondents from which relevant information were obtained were aged between 45-80 years. Members of this age group constituted about 80% of those that were approached for the survey, and such a percentage was justified by the experience and/or acquaintance with the cultures. The mass of raw data collected was analyzed qualitatively, since the data were in natural setting with no numerical values. To understand the data, written information was read and re-read several times. The information were categorized to identify any patterns (ideas) and organized coherently.

Onset of cultural perspectives

Visible and invisible objects

Among the Baganda, most of the things seen in the sky (*ebyenkunejje by'olubaale*) are light giving objects. Their common name is *ekyomubwengula*. Most traditionalists believe that celestial objects are spirits of the first people; *Kintu, Nambi, Gulu, and Walumbe*, among others, while the modern Baganda consider celestial objects as God's

creatures. One traditionalist had these to say:

Those many things you see in the sky are spirits of our ancestors. I believe my late father is one of them. Heaven is above...Unfortunately, so many people have died that you can't tell from the sky who your relatives are. When we die, we will join them and people on earth will see us twinkle.

Some of the objects seen in the sky have names, for example, the sun, moon, stars, galaxies, shooting stars, and clouds. The Bagisu generally know heavenly bodies as consisting of the sun, moon, stars, clouds and planets. On the list, the Banyoro add the rainbow, mist, and meteorites, and most of them believe everything was created by God, and the earth considered the place of humans, knowledgeable and part of God's knowledge. Similarly, the Langi tribe considers that celestial bodies mostly seen and known are the sun, moon, and stars, adding that the line of the Milky Way is at times visible.

The four ethnic groups considered also believe that there are many other objects or bodies in the sky which are unseen. These may include distant objects that cannot be seen by the naked eye, but air is unseen yet around us. Some Baganda think that there could be aliens somewhere in space. The Banyoro consider mainly spiritual things as unseen, which include; God, angels, ghosts, and earthquakes, adding also wind and sound. They believe that the Creator has made too many things for human to see and know all. In addition, there exists the heaven of an old woman. Similarly, the Langi focus on spiritual beings, regarding that there are evil spirits in the sky day and night, that keep descending to the ground to disturb humans. Other spirits, angels and God take up their place in the sky. In addition, some Langi consider that there are communication lines and waves that cause linkages in communication. An inquire of this nature was posed:

Can you imagine...how is it that we can listen to Capital FM from here? If there were no lines, we wouldn't! Tuning is like closing some lines and allowing one, by trial and error...But you people of science may have something else.

Most members of the ethnic groups have not seen any of

the celestial objects using any instruments because such instruments are rare, or there are no substantial outreach programmes. However, during solar eclipses, some people have used water in a basin and tinted glasses to view the sun. Some Muslim members have used milk to observe the moon. Only a few members of the ethnic groups have used a telescope at least once.

Desire for scientific explanation

Watching the stars and moon interests most members of the ethnic groups, notably their appearance, arrangement and spacing. Besides, stars twinkle in different sizes and colours, and they follow you whenever you move. Some Baganda wonder how big the stars are - yet they are seen as very diminished and give out light continuously. The moon changes brightness, shape and size, and possesses cool light. For the Bagisu, the stars and moon provide some light that removes total darkness during night time, and patterns formed by the stars are amazing. The Banyoro consider that stars have black centres and light on the outskirts, and the moon leads to changes of things due to its power. They also recognize the appearance and disappearance of shooting stars from north to south, and that there are so many stars in the sky. The Langi consider that looking at the many stars glittering with different intensities makes you trust your eye sight, and the fact that they do not collide could mean that there is a big cosmic order. Generally, the pattern, orientation, structure, size, and colours of stars and moon are breathtaking and leave a lot to be desired.

Culturally, most members of the ethnic groups receive explanation and guidance on the visible celestial objects from community elders and parents, with the Banyoro adding fore tellers and healers who always observe the changes of the moon. However, those who have gone through formal education and religious formations have been guided by teachers in schools and lecturers in institutions. Traditionalists among the Baganda believe that the appearances of objects in the sky are related to seasons, fortunes, disasters, or natural occurrences of events, which could be joyous or sorrowful. Some curious Bagisu feel that scientific guidance is still lacking on the things they see in the sky. The Langi elders say that the Milky Way (*Apokipiny*) separates drought and rainfall periods.

The majority members of the ethnic groups express high interest in knowing more about the earth and the stars. Some Baganda had already started following a radio programme on the same but the presenter unfortunately passed on. Some are curious to understand the coloured ring that sometimes appears around the sun and moon, and also if it is safe and affordable to navigate the deep sky. The Bagisu are interested in knowing how celestial objects can float in space despite being very heavy, and also how they maintain a definite path. The

Banyoro say it would be a privilege to use equipment and gain scientific explanation. They would like to know if anyone lives up there, or whether there is life elsewhere; the existence and residence of God; the internet and connection with machines to be able to use different communication machines comfortably. The Langi have a big interest to know the operation of the forces of the earth and their impact on humans. Besides, they yearn to understand what causes the movement of the sun and moon, and counting of the days and prediction of the future. All in all, members need scientific explanation that would enhance transition from traditional belief to acceptance of nature. It is hoped that a chance will prevail in which the heavenly bodies will be viewed through simple but modern astronomical tools.

Appearance of celestial objects

The Baganda recognize that stars appear slowly by slowly in the evening as darkness approaches depending on the weather. They think that the stars move because some of them appear seasonally. The Bagisu are cognizant of the fact that there are more stars in the sky during dry season and fewer stars during the rainy season, respectively. Besides, there are periods when one can spot some star patterns. The Banyoro say that the biggest star usually appears near the moon, hence named "friend of the moon" (*nyamuhaibona*), and that there are periods when there seems to be no stars, presenting apparently clear sky and thought of their whereabouts. In addition, the Banyoro take keen interest in falling or shooting stars (*kibonomu*), saying that they signify either problem or peace in the near future. Traditionalists among the Banyoro say that there are small stars which appear between 11 pm and mid-night, which guide the fishermen on mid-night entry. The Langi think that the sky normally turns around, making some stars appear and others not. They are aware of the seasonal variation of star patterns, where one sees Orion (*Lyer nino*) and Pleiades (*oyugu*) during the time for harvesting simsim (*nino*), and that dry season (*ooro*) is characterised by the presence of many stars in the sky, as opposed to rainy season (*cwir*).

The Baganda think that each of the objects in the sky is unique and has a different purpose, the reason they are called by different names. They recognize that some objects blink and others do not, and there is general variation in size, shape, light intensity, colour, among others. The Bagisu say that some stars resemble, especially those that exist within a cluster. The Banyoro say that stars ordinarily resemble by way of twinkling, but all objects seem to live in different locations, and stand on their own. They notice that the sun is quite hot and appears during day time, and the moon and stars are cool and appear during the night. The Langi consider that most stars appear the same, varying mainly in size,



Figure 2. The largest image on the moon (ESA, 2001), is depicted as a human being by the ethnic groups in Uganda.

intensity, and colour. The ethnic groups unanimously recognize that stars are not of the same size, with the Baganda and Langi saying that the bigger stars are brighter, and some tiny stars appear as a pool. The Bagisu think that one of the biggest stars is the morning star, and the smaller stars must be very far away. The Banyoro say that the majority of stars are smaller, and that the bigger stars have names.

The moon and its appearance

The ethnic groups recognize interesting pictures on the moon, depending on one's artist impression. The pictures are mainly figured out when the moon is at its full phase (Figure 2), for which all the light side of the moon is seen. Notably, the picture of a human being is visualized with various impressions. The Baganda mostly see a woman

that could be; carrying firewood and a baby, carrying a bucket, or breastfeeding her child, and to a small extent a man with an axe. Others see a yolk of boiled egg, bluish in colour (*kisibye egabogabo*). In the Baganda tradition, it is said that a woman had collected firewood on a Sunday, and God punished her to go to the moon with her child and a dog. They think the woman is probably *Nambi*. It is interesting to have encountered a sentiment of this kind:

When I see the new moon, I know Nambi will torment us the women again. As long as you are still young like those daughters of mine, you will have a share of Nambi's punishment. The men don't see their menstrual periods...and for us who are old, Nambi knows she has done enough...

The Bagisu also see a woman carrying a baby, but some think of God and Jesus, and art paintings probably map

of Africa. The Banyoro say that the picture is mysterious, and some think of a king sitting on a stool, or a woman carrying a baby. Curious Banyoro think that the picture could be black clouds or less illuminated parts of the moon. The Langi notably say that distance makes it so difficult to comprehend the images on the moon, but they think that there is a black woman sitting on the surface of the moon. Traditionalists among the Langi believe that the sun fought with the moon and left scars on it.

The ethnic groups have a wide range of ideas as to why the moon is not seen daily as the sun, saying that it is the plan of the 'Creator' that made the moon seasonal. The Baganda say that the moon is irregular, first charging from the sun before it appears, and that the moon usually changes its time of appearance, from early hours of the night to morning hours. So, it appears every night but at different times, hence we may not be able to see it on certain days. Some Baganda think that there is a time set aside for darkness where the moon is obstructed. The Bagisu think that the moon and sun have different roles for humanity, with the moon determining periodic changes during the month, including women menstrual cycle. The Banyoro think that the moon is used for counting days of the month, making it a natural calendar. When the moon first appears - new moon (*isongoro*), it is considered the first day of the month. In addition, they think that the moon takes long to orbit the earth, that is, more than 24 h. The Langi say that the moon disappears for renaming, and a song was usually sung for this. They take the moon to be a mysterious heavenly body that dies for at least three days in the east and appears in the west, then grows up to maximum size and diminishes again to die, and the trend happens every month. Others think that the moon is sometimes there, but can only be seen under a quiet forest.

The Baganda are amazed that the new moon is very small like a sickle, and grows to become big and reduces again. The moon keeps changing shape and size continuously. The appearance of new moon from the west attracts lots of interest. The Bagisu are concerned with the changing brightness of the moon - from very bright to bloody. They say that when it is raining at night and the moon appears, it stops raining. They also wonder how naturally the moon can obstruct light from the sun during solar eclipse. The Banyoro also take keen interest in the ever changing shape and size of the moon. It is at times very small, with a horn either left or right, and sometimes it behaves like a rainbow with many colours. When the moon is red in colour, an eclipse can easily occur. They say that during the dark moon night, children are warned not to walk about because they could meet bad creatures. The Langi say that when the moon is new and tilts on the right, it is a sign of good harvest, and vice versa. The moon's appearance is followed by some light rain even if it is dry season, to 'wash the eye of the moon' (*Iwoko wang dwe*). When the moon is rising in the east, it is mature and cruel.

The earth and horizon

The ethnic groups agree culturally that the earth is flat, labeling the teaching of science as confusing. The Baganda emphasize that we move on the earth and see it flat, which is what has been known for generations. The Banyoro add that the earth is flat and hilly, with the Langi saying that the earth is flat with an edge where the sun falls at sunset. The Langi tribe also considers the directions; East (*Tung-kide*), West (*Tung-too*), North (*Tung-anyaradii*), and South (*Tung-anyaralum*) are mysterious constructs. Most members of the ethnic groups understand that the sky appears to touch the earth due to eye sight limitation to distance. They say that the horizon is the point where our eye sight ends. Some Baganda think that the sky is curved like a hut, which makes it bend to touch the ground, while others think of an imagination because one never gets there in an attempt to walk towards the horizon. The Bagisu think that the eye is usually deceived by distance. The Banyoro think that the earth and sky are not meant to touch each other naturally, and say that as you move towards the point where they seem to meet, it will move also, but the earth continues to look flat. The Langi think that where the two seem to meet is the end of the earth, where the sun falls on the western side and emerges on the eastern side. They also believe that the sky is round, with a diameter equal to the length of the earth.

Naming of celestial objects

Common celestial objects known to the ethnic groups are; the sun, moon and stars. These are called using names that show similarity of purpose. Table 2 shows a sample of local names of familiar astronomical objects. These objects have been known from stories by parents and elders, and sky watching. To some extent, some have read about them from newspapers and religious books, as well as studying subjects like geography and physics. The appearance and functionalities of celestial objects have impacted their naming. To the Baganda, the sun is named *enjuba* because of its brightness, the moon - *omwezi* because it appears every month, and the stars - *emunyeenye* because they appear twinkling in the sky. Then, shootings stars are called *kibuno omu* because they are fast moving, and each of them can only be seen by one person and it disappears. In addition, the Baganda also have *sengendo* for planets.

For the Bagisu, the sun (*inyanga*) implies brightness or hotness (*lianga*) during day, *kumwesi* (moon) takes one month before reappearing, and *tsinieniesi* (stars) are heavenly bodies that twinkle or glitter in the sky, that is, the stars have sparkling lights. The Banyoro too have *izooba* (sun) because it keeps on coming (*eyezooba*) daily with its light, and it is similar to the yolk of an egg. It is believed to be the god that formed everything (*kazooba*

Table 2. Celestial objects commonly known to the ethnic groups in Uganda, and their local names.

| Object | Baganda | Bagisu | Banyoro | Langi |
|----------------|----------------------|---------------------|----------------------|----------|
| Sun | Enjuba | Inyanga | Izooba | Ceng |
| Moon | Omwezi | Kumwesi | Okwezi | Dwe |
| Stars | Emunyeenye | Tsinieniesi | Enyunyunzi | Acer |
| Shooting stars | Kibuno omu | Kibona omu | Enyunyunzi ze mikira | - |
| Evening star | - | Inienes iye kumwesi | Nyamuhaibona | Malayila |
| Morning star | Munyeenye y'okumakya | Solia | Kinywanambogo | Etop |
| Clouds | Ebire | Kamafumbi | - | Pol |
| Rainbow | Musoke | Lufutu | Omuheziba | Atarloka |

nyamuhanga), and has the highest brightness of light. The origin of *okwezi* (moon) is *okweza*, meaning high yield, harvest, and even human production. The moon is seen as a kind of god because everything has a source in it, and it gives out plane cool light during the night. It is still considered so among Muslims, with its image put at the mosques. The moon appears 13 times a year, giving 28 days for an average month. *Enyunyunzi* (stars) are called so because they twinkle or glitter in the sky. In conjunction with clouds, stars look like flowers which decorate the sky, and some form interesting pictures. The Langi have similar naming too; the sun (*ceng*) gives light during the day, moon (*dwe*) comes on a monthly basis, and stars (*acer*) glitter or have sparkling lights. Women prepare for their monthly cycle upon citing the new moon.

Some Baganda are able to recognize some star patterns and bright stars. For example, morning star (*alitagiri* or *munyeenye y'okumakya*), Pleiades (*nakakaaga*), which form a pattern of Christmas tree, and three clustered stars (*nakasatwe*). Most Bagisu do not recognize star patterns, but are aware of bright stars and their colours, notably the morning star (*solia*). The Banyoro recognize mainly shooting stars (*enyunyunzi ze mikira*) which are associated with bad occurrences, Pleiades (*ekikaaga*), stagnant stars in the east and west, three aligned stars in Orion, and a bright star that comes along with the moon (*engazi yo omwezi*). Star patterns commonly known to the Langi are: Orion (*lyer nino*), which is a symbol of simsim harvest from the lining of the three stars (Orion belt) equated to poles used for drying simsim; Pleiades (*oyugu* or *acer abicel*) with many stars but only about six are seen in turns, and sometimes shooting stars emerge from it. They also recognize the Milky Way (*apoki piny*) which they think divides the sky such that dry season is represented on one side, and wet season on the other side.

To the Baganda, the evening star is thought to be near the moon. It is usually the first and brightest star to appear in the sky, and brings relief when there is no moon. The morning star (*munyeenye y'okumakya*), also named Stella Maris, portrays peace in a new day, and it is

the last brightest star just at dawn. For the Bagisu, the morning star indicates day break, the time to prepare for prayers, and the evening star is recognized when the moon is about to appear. The Banyoro call the morning star *kinywanambogo*, which marks the end of the night and the beginning of day time. It is also seen as the friend of buffaloes, appearing usually at dawn in the east. The evening star (*nyamuhaibona*), also called the friend of the moon, always appears in the west. It marks the end of day time and the beginning of the night. The Langi call the morning star *etop*, believed to guide the sun to rise to mark the end of the night, and the evening star *malayila* because of its enormous brightness, or *cwar dwe* (husband of the moon) because the new moon normally appears close to it and gets persuaded.

Celestial objects and weather changes

Among the ethnic groups, weather changes can also be predicted by observing the moon and stars. The changes in appearance of the heavenly objects can show that it is going to rain or not. Usually, when stars are very many in the sky, it is dry season, otherwise rainy season. The Baganda expect sunshine when the moon is bright red in colour. The Bagisu say that the new moon comes with rain as a blessing from the Creator. The rain is said to wash the new moon. At full moon, less or no rain is expected. For the Banyoro, when the new or full moon is too bright, rains and plenty of food are expected, that is, good harvest. This is also true when the stars are too bright. In contrary, when the moon is not clear, people expect sunshine, so never waste seeds. The Langi present a number of considerations, including the positioning and colour of the moon, as well as the Milky Way. Too many stars with cold mornings and evenings would imply dry spell, yet fewer stars and cloudy sky signal rainfall. The new moon always comes with rain to wash the face of 'baby moon' (*atin dwe*), but a reddish moon would show that there is going to be sunshine for some time.

Observation of celestial objects and interpretation of weather patterns are taught mainly by parents and elders in the community, and everything begins from childhood. To some extent, self-viewing, reading, and personal experiences also play a key role in understanding celestial objects. In Buganda, most of the information is passed during time for eating in the evening. The Banyoro also have story tellers and information from their Palace, and most of the information passed at the fire place. The Langi start passing information as soon as the child begins to talk and this continues through to the time when someone is able to graze animals.

NATURE AND SOCIO-ECONOMIC ACTIVITIES

Celestial Objects in Agriculture

As in weather prediction, the moon's appearance and number of stars can enable someone decide to plant or clear the garden. With a reddish moon and too many stars, sunshine is going to be too much to plant any seeds, but is good time for harvesting and drying of crops. With fewer stars and bright moon, the rains will be in plenty for crop production. Farmers among the Baganda and Bagisu, to some extent, use the bright full moon to wake up early and dig at dawn. They usually plant just at the end of dry season when there is suitable warmth for germination and subsequent downpour for moisture. The Banyoro do follow weather changes brought by the moon. By seeing trees shade off their leaves and regenerate, grass and rains, the farmer should start sowing. The position of the moon indicates an activity to be done. For example, the moon on the 15th day, planting for the first rain, with sufficient warmth for seeds to germinate and grow. For the Langi, the bright moon also helps people wake up early for digging, with birds singing and rejoicing as well. Fewer stars and unclear moon signal plenty of rainfall which the farmer utilizes for planting. And when the stars are too many in the sky, it is dry season. The farmer does harvesting and drying of crops, as well as planning for the next rainy season.

Celestial objects in fishing

This cuts across the ethnic groups. When the moon is too bright and just about full, fishermen rarely cast their nets because they can hardly catch fish. This is even worse with the moon shining directly overhead, because the net and fishermen are visible to the fish. Therefore, it is mainly during new or dark moon that more fish can be caught, and according to the Banyoro, the growth of the moon within the month leads to decreasing fish harvest. However, other fishing methods work well with a bright moon. For example, those who use hooks and baits can

extend their fishing time to night hours, as the fish will be able to see the bait and go for it. The Bagisu say *Dagaa* fish usually come near the water surface when there is moon light, so can be collected using fish baskets. The Langi also reveal that the moon and stars also help fishermen to determine direction of the wind in order to minimize accidents in water.

Celestial objects in hunting

The ethnic groups say that some animals do move at night, so can be trapped and caught using moonlight. At new moon when some rains come, hunters can easily sight animal foot marks, so can lay their traps or nets. During the dry season, animals usually hide from the heat, but come out in large numbers with rainy season, as the moon and grass appear, so they can be trapped. The Baganda believe that the small god (*ddungu*) uses the moon and star lights to hunt in the night. The Bagisu say that it is difficult to collect white ants when the moon is bright because the moon will provide a wide alternative lighting system, but antelopes usually graze with clear moon light, so can be captured with nets. For the Banyoro, buffaloes enjoy eating with new moon and morning star, so hunters can trap them. Also, catching grasshoppers, white ants, as well as picking mushrooms, are all done with dark or new moon. The Langi consider that hunting is almost done throughout all seasons, but it is difficult when there is too much rain and the grass has grown tall. So, little rain is desired to spot animal foot marks.

Celestial objects in traditional and spiritual rituals

Muslim members of the ethnic groups follow the moon to determine holy months, especially the month of Ramadhan (9th month of Islamic calendar) to enable them fast. Fasting normally begins on sighting of the new moon and continues until the next new moon is seen. The Islamic religion as a whole uses the new moon and stars as symbols. The morning star indicates day break, hence preparation for early morning prayer. Christians on the other hand use stars to remember the joy of Christmas because it is said that a star directed the shepherds to the place where Jesus Christ was born. Thus, star signs are used to proclaim good news. Overnight prayers are quite good with bright moon light and clear sky. In Buganda, the new moon triggers night dancers' operation, and traditional healers as well use the brightness of the moon. Also, women prepare for their monthly periods. For the Bagisu, night dancers also use the dim moon light, usually with the appearance of the new moon. At half-moon, wild animals give birth and most women have their menstrual periods. It is also believed that this is the time for movement of the spirits of the

dead. People usually gather around to worship as the god of the moon shall be watching over them directly at night. For the Banyoro, ancestors performed sacrifices during the new moon (*okubembeka*), presenting everything at the traditional altars, hence prayers, eating, singing and dancing are done, similar to Christian practices. At the new moon, lots of sacrificial ceremonies (*ebibali*) take place at the altars. Regalia holders appear and prepare the king (*omugabe*) to sit on his throne, and perform functions at the *embareko*. The king would visit the kraal in the palace and cultural rituals are performed. Also, most kids are known to develop new teeth, and there is dancing of the twins, and some traditional faiths are effective upon citing the new moon. Men and women usually assemble at sites to perform cultural rituals, which are also done for fishermen and hunters. Treatments for various sicknesses are done following the changes of the moon. For the Langi, things are gradually fading, but also done according to the appearance of the moon, mostly faint moon (new or dying moon). Depth of epilepsy disease and treatment and rebuking of associated spirits can be done. Such is the period when the deaf and eunuchs can gain strength to some extent. At new moon time (young moon in the west), children are told not to go outside their house for fear of getting infused from rituals, which are mainly done around such times. Rain makers would study the moon and stars, and in case there was drought, they would assemble under a big tree (*kworo*) to dance the rains (*myelo kot*). Newly born children are not allowed to view the moon, until the first time when they are shown the moon with a pasting stick (*lut'ogwec*) three or four times, for boys and girls, respectively. Similarly, when it drizzles, the child is given rain drops three or four times depending on the sex, to prevent some small swellings and burns on the child's body.

Before the coming of religion and technology, the ancestors attached entirely everything to gods, namely; the gods of the sun, moon, rain, and so forth. Such gods were created depending on the usefulness of the celestial bodies, and were responsible for their appearances. For the Baganda, the god of the clouds or sky (*kibuuka*) used to rise up during wars. He was never stopped by arrows, and was always a successful warrior. The god of rain (*mukasa*) was invoked whenever there was drought. The god of hunting was called *ddungu*, and rainbow (*musoke*) was related to the god of water. For most women in Buganda, whenever you see the moon over you, it means you are pregnant lest you fall sick. For the Bagisu, the god of the sun was associated with blessings, and the moon was considered a god because of its characteristic appearance and disappearance. There is very scanty information about them nowadays. For the Banyoro, the sun, moon and stars are symbols of gods. The sun is believed to be a miraculous god (*kazooba nyamuhanga*), and the strongest god since it also appears to be the strongest of the heavenly bodies. He is worshiped and its hotness means that if you do wrong, you will be burnt.

Witch doctors use water and glittering sun to perform their things. Also, women perform rituals near the fire to associate with the sun. The morning god is associated with the morning star (*kazooba omuchezi*), and is related to the sun. The Langi religiously believe in *Jok'amalo* (God in the sky), and consider every happening on the earth to have connections with events in the sky. The *Jok'amalo* is believed to be the only one God, the Creator and source of everything.

Events associated with the appearance of celestial objects

In Buganda, fasting for Muslims is associated with the appearance of the moon. When the rainbow (*musoke*) appears, people pray or ask for what they want. For the Bagisu, bent or tilted moon is a sign of war; shooting stars are associated with a prominent person dying if he or she is in a critical condition; when dry season becomes foggy, then there will be worms and dust shall be lifting eggs from one place to another since they will be light; an orange colour of the sun means dry season is coming to an end, and rainy season will follow so farmers can start planting. For the Banyoro, the moon's appearance is a sign of drought or rain, as well as diseases. Naming of children depends on the appearance of stars. Certain times you do not have to cross a river or pass a forest, neither do you fetch water at midnight nor midday. For the Langi, harvesting and celebrations are mostly done during the dry seasons when stars are many and the sky is bright; a ring around the moon is believed to be indicative of the death of an important person; sunset implies night time is approaching, and morning star brings forth day time; too much wind is a sign of drought and famine; and very bright sky and hot weather, one expects pest and diseases.

Perceptions of the rainbow

All cultural beliefs align with religious beliefs. Therefore, the rainbow is a sign of God's fulfillment of his promise never to again destroy humanity with water or rain. Hence, the rainbow is seen as a blessing. To the Baganda, the rainbow signified a spirit drawing water, so no rainfall is to be experienced. It, however, shows God's anger towards his people, but because of his mercy, he sends the rainbow (*musoke*) to suck out the rain and avoid floods. Hence, the otherwise bad rain is absolved by the rainbow. To the Bagisu, the rainbow stops rain when it is coming. It can suck blood from a person who attempts to cross it, or those who may be found fetching water. The rainbow is also a sign of God's displeasure with humanity, but he has forgiven them. There was likely to be a heavy downpour, but prevented. So, people should glorify and worship the Creator. For the Banyoro,

the rainbow is the sign to prevent more rains. It appears opposite to the direction of the sun, and no serious rains would come. When the rainbow stands on your side, do not attempt to cross it because it can suck your blood. A well and palm tree are found where the rainbow is formed, the site of which is used to perform rituals. When there is little rain falling and sunshine, it is believed that a leopard has delivered. For the Langi, it is believed that when a rainbow appears, it is not going to rain at that moment. The rainbow usually plants its ends in two swamps (wells). It is believed that lightning has delivered children in the ant hills near the swamps, and it has come with frightening colours to pick them. When you hear the sound of lightning, then it has picked the children believed to be like clocks. It is also at the swamps that lightning camps, in case someone has sworn by its name. In such cases, someone should take a calabash with ashes, and sow the ashes continuously in the direction of the rainbow until it disappears. Anything hit by lightning is not eaten by any ordinary person but *itogo* who is able to rebuke the lightning. When lightning strikes someone or something near a home, a special tree (*iburka*) is planted at that spot to prevent any future occurrences.

Wonders and myths

Across the cultural board, the introduction of religion, education and technology has somehow influenced the traditional view point of the celestial objects. Homilies by priests and knowledge of science demystify traditional beliefs and practices. The work of the astronomers has revealed that the sky is vast and contains other planets that could support life. It is wonderful that technology has made the moon reachable. It has also come to be known that some moving stars are actually satellites, and that God has created everything including the sun that supports life on earth. Flights have also enabled some people to see the curvature of the earth. However, the majority of the traditionalists still hold their perspectives of heavenly bodies.

The night sky

The Baganda say that the night sky is a wonderful God's creation. Many things to ponder include eclipse, shooting stars, God's arrangement of the celestial bodies, and earthquakes. The moon normally starts from the west and dies in the east, contrary to the rising and setting of the sun. As a myth, the full moon signifies a dangerous night, and the night sky is good for someone who is swallowing. The Bagisu say that stars are guides for people fishing on big lakes to determine direction, and think of the sky as God's dwelling place. Shooting stars are only seen by one person at a time, as falling from the sky. If two people

see them at the same time, then they will die on the same day. For the Banyoro, the eclipse of the sun takes place during the day, but it is dark again. Many Baganda and Banyoro wonder because shooting stars are only seen by one person at a time (*kibonomu*), noting that they are very bright and so fast that you can't move in the house to ask someone to come and see them. They are seen as blessings (*okubonekerwa*), and some Muslims sleep outside to see the miracle and be blessed. The Langi are amazed at the highly ordered star patterns and no collisions of celestial objects even when there are movements. One wonders how the Creator made the earth and the objects in the sky, and whether there will be an end or not, and why drought comes when there are too many stars, and vice versa.

Movements of celestial objects

Majority members of the ethnic groups are aware the earth's rotation causes the apparent movements of celestial objects across the sky, noting that as the earth we stay on rotates, we pass these objects and contrary to our movement, we see them moving. The Baganda think that it is God's arrangement that objects are seen to move in the sky. Some have been taught that the objects in the sky do not move, only the earth moves. So, it is thought that the earth moves around the stars. Others think that heavenly bodies are in constant motion. The Bagisu say that some of the celestial objects don't appear to be moving but move naturally. The Banyoro say that people do not think much about movement of celestial objects, instead they are interested in their position and time of appearance. People usually know the movement by changes in position of shadows of some prominent trees. The traditionalists believe that God commanded celestial objects to move, a culture which must be maintained. The movement is puzzling, only God knows where they change positions, and seasonal changes. The Langi think that the movement of clouds causes the movements of other heavenly bodies. Culturally, the earth is fixed, and the objects in the sky must be moving. They are believed to be alive, so they must characteristically move. Others think that it is the sky that rotates due to God's power, so God moves the objects, and they are in motion with respect to the stable moon.

Time for the celestial objects

The Baganda and other ethnic groups believe religiously that it is the plan of the Creator that stars appear during the night, and the sun during the day. God gave the sun and moon authority, the sun being king of the day and moon king of the night. But most members are enlightened and know that the sun's light overpowers the stars, but they are also there during the day. Some

members think that stars hide or sleep in the clouds and sky. The Banyoro think that stars have dim lights, but according to nature, they are ever there, whether raining or shining. As a confirmation, the morning and evening stars are clearly visible with decreasing sunlight intensity. Because of enormous distance, light from the stars can only be supported by darkness. The Langi say that the stars are far high up behind the blue sky, so can't be seen with the bright sun light that overpowers them. But under a forest, it is possible to see stars in a clear sky.

Most members are also enlightened and applaud the earth's rotation for the daily movement of the sun. During night time, the sun is on the other side of the earth, thus part of the earth can be in the light and another in darkness. The Baganda say that at sunset, the sun goes down to give light to other countries, so the sun does not hide. Some think that the sun falls in a hole, and goes down to sleep and rises early morning in the east. Others say that it is God's arrangement that the sun appears during the day and stars at night. The Bagisu also say that the sun does not hide, except the dark side of the earth shall have turned away from the sun. Some Banyoro, however, wonder and think that the sun hides in the clouds, or falls down and dies in the evening, then rises in the morning. Others say that the sun stays in its resting place according to the command of God, not to give light during the night, and the shape of the world, flat and hilly, hides the sun. However, when you follow the sun, you will continue seeing it. The Langi similarly believe that the sun falls down at sunset, and it is a bad omen for somebody to meet the sun going back to the east during night time. Thus, the sun sets and plans to go back where it rises in the east, giving us another difficult time of the day.

The sun is thought to be different from stars. The Baganda say that the sun is the sun and stars are stars full stop. It is another body of its own, huge, round and very hot. The sun appears during the day and stars during the night. Very few think that the sun could be a big burning star so near to the earth, hence its enormous brightness and hotness. Likewise, some Bagisu think that the sun is a very big and hot star, because it also twinkles. The Banyoro think that the sun could be something different, not quite known. Just like the Baganda, they say that the sun is sun, stars are stars, and moon is moon. But being single, the sun is like a star but disappears soon. So, the sun is a body on its own and is quite massive. The Langi also say that the sun is culturally different, because if it were a star, we would see it at night. It is said to be a big object with too much heat that extends to the earth. During dry seasons, it is hot and people believed that the sun has moved closure to the earth.

The eclipses

The Baganda say that, for the sun and moon to meet,

they will fight to be in one position, a coincidence which is quite rare. It can create half day and half night, which is quite a scaring moment that people are advised to keep indoors. It is said that the moon normally wins. For the Bagisu, if the sun and moon meet, something will happen which we cannot tell now. Some say another sign of God's annoyance, which can lead to the end of the world or universe. The Banyoro think that the sun and moon meet in a fight called eclipse (*izooba likulwana no mwezi*). Some think that the world may come to an end, so people are advised not to be moving because darkness can get them where they do not desire. A story is told among the Banyoro that a king went to war in Ankole, a neighbouring region of the Banyankole, in which two eclipses occurred and the king lost one of the wars.

Therefore, eclipse of the sun is associated with bad luck or change in leadership. Some people think that the fighting of the sun and moon is according to God's power, to show human beings that God can perform miracles. The sun wins during the day, and vice versa, because of God's authority. It even means that when human beings die, they can meet. The Langi think that when the sun and the moon meet, it is a sign of problem because it causes coldness and darkness of the day. They say that the sun moves to the west and moon moves to the east, so they can meet and should be a systematic event which occurs in a given period of time.

The night darkness

The Baganda say that being outside the house at night depends on someone's ways of life, reasons and environment, but not for security purposes because dangerous people and animals abuse the night to do mischief. Besides, strange and weird things happen at night, including night dancers at the appearance of new moon. The night's coldness is said to be unfriendly to humans. However, night time is good for personal viewing and mastery of the sky. The Bagisu say that planets and stars are not harmful, except some people take advantage of darkness to do mischief. The Banyoro say that wrong doers move at night, and also there are wild animals that can attack. In addition, the visibility at night is poor, so it is difficult to tell what might happen, and bad spirits (*ibigasaigasa*) also move at night, so can befall those loitering in darkness. They say that if unavoidable, there should be clear moon light, or someone should use a torch and fire. The Langi fear someone may meet the sun returning back to the east, a situation that will lead to illness, unless a ritual is performed. During dry season, only elders would stay outside to study the weather patterns; otherwise, darkness is for sleeping and resting; security is required because many bad things happen at night, which include movement of wild animals and performance of rituals.

Formation of celestial objects

The Baganda say that the stars and moon were created by God at the beginning of the world, although others say that the visible heavenly bodies are the spirits of the ancestors. The Bagisu, Banyoro and Langi also agree to the notion that heavenly bodies are God's creation, that is, the existence of stars, moon and other objects resulted from God's order. The Banyoro think that God the Sun (*Kazooba Nyamuhanga*) created the stars and moon. Traditionally, there is a Creator for all things in heaven and on earth. The Langi say that a person with a big hand created them and placed them in their rightful positions with instructions. They believe that objects obey the Creator, hence the natural order. One senior member said:

Children, if God had no hand in these things, the world would be in chaos...coronavirus would be like nothing...many heavy objects would be falling every now and then! Would anyone be able to exist? God is alive, even if some of you are unbelievers.

If the celestial objects suddenly disappeared, it would leave a lot to be desired. The Baganda say that it would be the end of humanity and living things. There would be total darkness and unbearable environment; everything would collapse, and day and night become indistinguishable. It would be a nasty experience and disaster over the whole world, and even criminals may find it difficult to operate. The Bagisu also think that the world would be very dark and problematic to people and animals and they will die. It is what everyone wonders, but everything would freeze, no warmth and light to support growth, and life would gradually come to an end. To the Banyoro, there would be total confusion, desperation, and end of the world. It would be a day of hell, and everything destroyed. The king would lose his throne, and there would be total panic. They also think that even if the sun and moon were to change their course, that is, the sun starts from west and moon from east, that would be a disaster. The Langi think of a big calamity that would strike the whole world, an indication of the end of the world. And there wouldn't be things like today, yesterday and tomorrow, and perhaps the Lord would come and people disappear.

Other concerns

The Baganda say that the sky is God's creation and the characteristics of its objects should be preserved. It hides heaven where man's soul will live forever, and underworld is the home for the evil spirits where *Walumbe* stays. Another sentiment came in here:

By the way...For us in Buganda, Nambi and Walumbe are

a problem...Walumbe is the cause of death. He wants everyone to be with him in the underworld. It must be a hard life there. To be with Kintu up is much better.

They add that on judgment day, everything will be at the same level. The government should help establish sites where the local population can access instruments to navigate the sky. People believe that *musoke* regulates the amount of rain water by sucking from the clouds and pouring into the lakes or rivers. Most traditional sacrifices are done during the time of the new moon (*masumi*), and one also wonders why clouds change colours.

The Banyoro believe that there is blessing from the sky because rain comes from there. The sky is synonymous to heaven and is God's dwelling place. On the other hand, the inhabitants of the underworld are ghosts. Clouds are shades that cover us from the sun's heat. Stars and moon are beautiful and believed to be symbols of excellence that are controlled by God. Many people are excited at the new moon, and the moon cycle is counted by tying knots, which help in planning activities including taking cows for mating. The new moon in general signifies production, and women are told that they can predict the period they are able to conceive from the time the new moon appears. Such a period is characterized by limited or no rainfall. The moon appears thirteen times in a year, hence the number of times a woman sees her periods. There is a black insect that glitters at night like stars. Such insects were quite many during the dark periods of the moon. Parents discourage children from touching these insects in fear of cancer.

In Lango, when lightning strikes someone dead, burial takes place near a swamp, contrary to which lightning will disturb. Immediately an eclipse occurs, or a unique sign is seen, elders usually assemble under a tree at around one O'clock to fast, pray and apiece God for people's sins. In 1820, a meteorite is said to have fallen in Langi closed to Ngetta, Obim and Erute, splitting the people who had settled there. Ngetta Hill took up the name for the split, but itself was not the meteorite. Traditionally, people used to focus the weather and trends of events for the year accurately, but this has been affected by western influence and religion. Some enlightened members say that it is important to strengthen traditional view point with scientific truth, which must be explained to the local people. The Langi interpretation of the simultaneous occurrence of sunshine and a drizzle is that a hyena is giving birth near a kraal at that very moment. It is thought that the earth is the biggest planet, and life after it will be in heaven. Most people lack knowledge of the heavenly things, which is perhaps attainable with very high level of education. There are many visible flying objects, the mechanisms of which leave a lot to be desired.

Conclusion

For the first time, it has been possible to obtain primary

information on cultural astronomy in Uganda from four ethnic groups. There are many aspects in which the cultures treat particular celestial objects in a similar way. The four ethnic groups have attachments to a few of these objects, some of which are myths that need to be unlearned through scientific means. It has been found out that only a few stellar constellations are known to most Ugandans. There is need to find out what other ethnic groups in Uganda have to say, something that should constitute the second paper. Since the sky is a natural laboratory, astronomy outreach programmes are recommended in Uganda, in which the population will have access to view celestial objects through a telescope and acquire scientific explanation of what people see from time to time. This will strengthen the teaching of science and modern astronomy at schools and universities.

CONFLICT OF INTERESTS

The authors declare no conflict of interests.

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Full Length Research Paper

The role of elephants as military pack animals in the Abyssinian Campaign, 1867-1868

R. Trevor Wilson

Bartridge House, Umberleigh, EX 37 9AS, UK.

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In late 1867 the British Government authorized a military expedition to effect the release of 59 hostages being held at Magdala by Emperor Tewodros II. The force consisted of 13,000 soldiers and 40,000 transport and pack animals. Its formidable task was to travel 650 km and ascend 3,050 m of altitude before it reached its goal. The animals comprised horses, mules, donkeys, bullocks, camels and 44 elephants. The elephants were loaded on ships at Bombay by means of slings. Loads for the elephants varied in the range 600 to 730 kg for those transporting 12-lb breech loading Armstrong guns and 800 to 840 kg for those carrying 8-inch mortars. These loads were 12 to 16 times heavier than the normal 55 kg mule load. Tracks had to be cut and levelled before the animals could pass and they struggled to mount the steeper inclines. Only five elephants died during the expedition and 39 returned to Bombay.

Key words: Ethiopia, Eritrea, artillery, mortars, cavalry, infantry, warfare.

INTRODUCTION

In 1862, Tewodros II (Theodore), the Coptic Christian Emperor of Abyssinia (now Ethiopia and Eritrea) asked the British Government for help in obtaining the latest weaponry and for tactical experts to help him in his wars with his mostly Muslim neighbours. He received no answer, took umbrage, and incarcerated several Europeans as hostages at his base at Magdala in the highlands. Among the hostages was the British Consul who was kept in chains for over two years. As there were also British women and children amongst the hostages the general public demanded that the government do something about it. Diplomatic approaches and gifts did not persuade the Emperor to release the captives such that by June 1867 it was reluctantly concluded that military intervention was necessary. The action was not, however, to be a mission of conquest: the military force

would withdraw once the hostages were freed and Theodore punished. Very few personnel were sent from Britain. The expedition was staffed from Bengal and Bombay forces, comprising Indian Army regiments and British regiments serving in India that were usually used to maintain British control. Commanded by Lieutenant-General Sir Robert Napier, a massive force of 13,000 troops and 40,000 baggage and transport animals landed at Zula, now in Eritrea, in December 1867. Magdala was just short of 650 km (400 miles) from Zula and 3050 m (10,000 feet) above sea level. There were no roads to speak of, so these had to be constructed. Indeed, one of the first orders given by Napier after his arrival was to clear and make passable by elephants the road up the escarpment to Senafe, at an altitude of 2,446 m (8,025 ft). At the same time he instructed that loading and

E-mail: trevorbart@aol.com.

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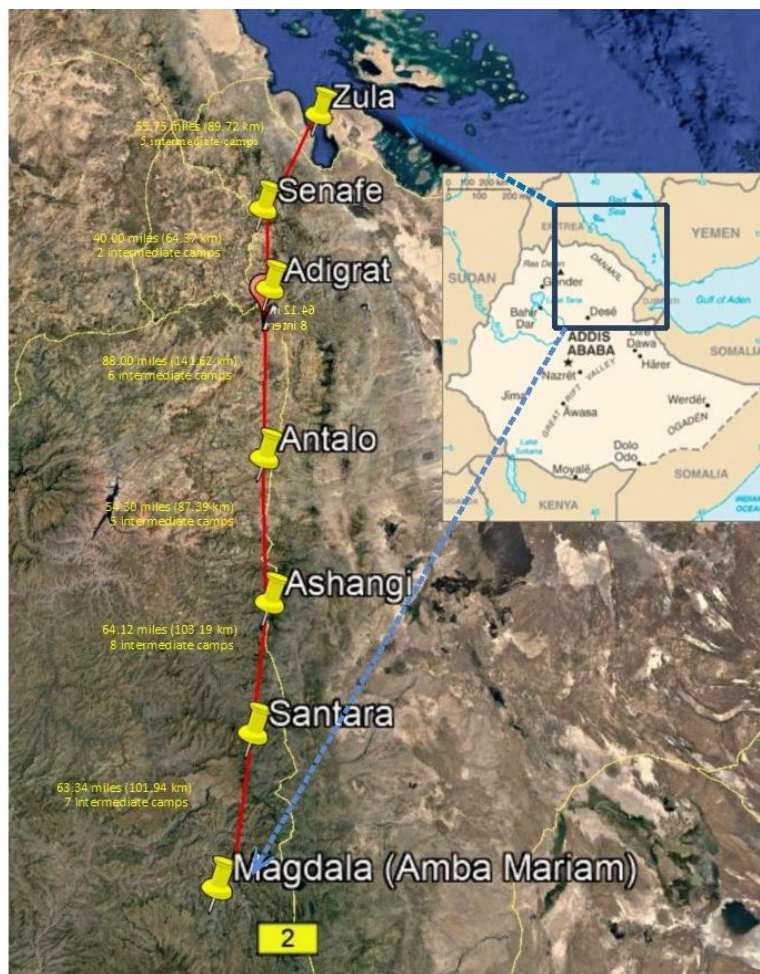


Figure 1. Map of route taken by the Abyssinian Expedition from Zula to Magdala, showing the principal staging points (Constructed by the Author from information in Holland and Hozier, 1870).

unloading the elephants with the heavy armaments should be practised (Holland and Hozier, 1870: 384). Innovations in the warfare of the period required a harbour to be constructed, 32 km (20 miles) of railway to be built, the laying of telegraph line over most of the distance and the use of desalination plants to turn sea water into fresh water (NAM, 2020)¹. Depots were to be established at strategic points along the route which first went in a generally westerly direction to Senafe then southerly to Magdala (Figure 1). The route taken to Senafe was about 96 km (60 miles) and was a march of five days for the troops.²

¹The 33rd (Duke of Wellington's) Regiment of Foot was a conspicuous element of Napier's army. It is now the 1st Battalion, The Yorkshire Regiment whose Battle Honours include "Abyssinia and whose mascot is an Indian elephant.

²The distance from Zula to Senafe "as the crow flies) is 66 km (41 miles). There is now no direct road from Zula to Senafe and to reach the latter from the former one must travel north to Massawa, west to Asmara and then south to Senafe, a distance of 273 km (169 miles). The author of this paper has mixed

Almost 100 years after the event one noted war correspondent and author wrote:

There has never been in modern times a colonial campaign quite like the British expedition to Ethiopia in 1868. It proceeds from first to last with the decorum and heavy inevitability of a Victorian state banquet, complete with ponderous speeches at the end. And yet it was a fearsome undertaking; for hundreds of years the country had never been invaded, and the savage nature of the terrain alone was enough to promote failure (Moorhead, 1964: 264).

Another description of the Expedition states that this was "a hostage rescue in the 19th century conducted by British forces that is perhaps unparalleled in scope and

memories of Senafe as in August 1974 his vehicle was hijacked and burnt by guerillas of the Eritrean Liberation Front struggling for Eritrea's independence from Ethiopia

audacity” (Zoll, 1988). Yet a third describes a similar situation:

The endeavour of the author of this sketch has been to present to readers a succinct and impartial account of an enterprise which has rarely been equalled in the annals of war. In the Abyssinian campaign the enemies to be feared more than the open foe were natural obstacles and starvation. These were successfully encountered and subdued. The difficulties would have been more apparent, had their reduction been less skilful. The danger and possibility of disaster would have been more manifest had they been less carefully guarded against (Hozier, 1869:v-vi).

The objective of this paper is to describe the part played by elephants in the campaign and examine the problems they met and the ones they caused.

METHODOLOGY

This paper is largely based on an analysis of the official record of the Expedition published in 1870, two years after the events described herein took place (Holland and Hozier, 1870). Additional contemporary accounts of the campaign together with more recent publications were consulted to complement the main document.

RESULTS AND DISCUSSION

Elephants in war

There is a considerable body of literature on the use of elephants in war and they have been used by man since the earliest historical times (Lightfoot, 1981; Kistler, 2007). Ancient Indian texts detail the various methods used for their capture and training, and Indian drivers or mahouts were acknowledged throughout the ancient world as the most expert handlers of the beasts. The first experience by Europeans of their use in warfare occurs during the campaigns of Alexander in the fourth century BCE. In addition to use as cavalry and transport animals, they were important because their huge size, waving trunks, fearsome tusks, trumpeting and smell alarmed both men and cavalry horses (Charles, 2007). The most well-known use of elephants is related to Hannibal's crossing of the Alps (Glover, 1944). What is perhaps lesser known is that Hannibal took 37 elephants across the Alps but 36 later died (Edwards, 2001).

In the period of the Sasanian Empire (224-651 CE), located in what is now Iran and some surrounding areas, there was extensive use of elephants (Daryaei, 2016: 36-41). These formidable beasts were used in set piece battles, in siege warfare and for transport of material although they were probably most important in the transport role (Rance, 2003). In battle, elephants were fitted with platforms that formed a stable base for carrying archers whose elevated position provided an advantage

over foot soldiers or even conventional cavalry (Figure 2) (Farrokh et al., 2018).

The Asian elephant was once widespread in China and occasionally used in battle there. Many individual animals and some herds were reported from central and southern China in the first ten centuries of the Christian era. When attacked by the maritime state of Wu in 506 BCE the Ch'u commander used elephants with torches tied to their tail to attack the opposing army. In 554 CE two armoured elephants with towers on their backs and driven by Malayan slaves were sent into battle with swords lashed to their trunks. At a later date elephants used in battle carried ten or more men (Schafer, 1957).

Elephants were used in Africa by Hanno during the Libyan war in 240 BCE when he stormed the fortress of Urtica (Glover, 1944). The “conventional wisdom” is that African elephants cannot be captured and trained but this species has been used at least twice in African warfare. There is the case of those used by Hanno just cited and they were also used by Ptolemy II of Egypt about 285 BCE (Gowers, 1947).

The elephants in Abyssinia

The first mention of elephants in the campaign's Official History is in the Preface to Volume I which considered that the different characters of the high and low country would be important in the type of transport animals to be used. In the low country camels could be used but they would be useless in the highlands and would need to be replaced by donkeys, mules, bullocks, elephants or men (Holland and Hozier, 1870).

Napier expressed concern at a suggestion from higher authority that the number of troops should be reduced as his calculations had brought him to the conclusion that the mission would only be successful with the number he had decided on. He conceded, however, reductions could be made were some of the field artillery replaced by mountain batteries. The Viceroy of India was prepared to send a battery, complete in all respects, of light rifled mountain guns. A similar battery had been requested from England. He then proposed to use elephants to transport the guns and carriages of a field battery (Holland and Hozier, 1870). It was considered that most of the transport animals, comprising donkeys, mules, oxen and camels, could be obtained in Abyssinia. Saddles and other harness would need to be taken from India as would sufficient cradles and other equipment required to carry or draw the guns and mortars: wheeled vehicles other than gun carriages and ammunition carts should not be used. The only animals required from India in addition to cavalry horses would be elephants. At this stage Napier asked, among many other things, that one mortar battery with elephants be sent from India. It was later decided that one field battery of Armstrong guns accompanied by elephant carriage also be sent (Holland

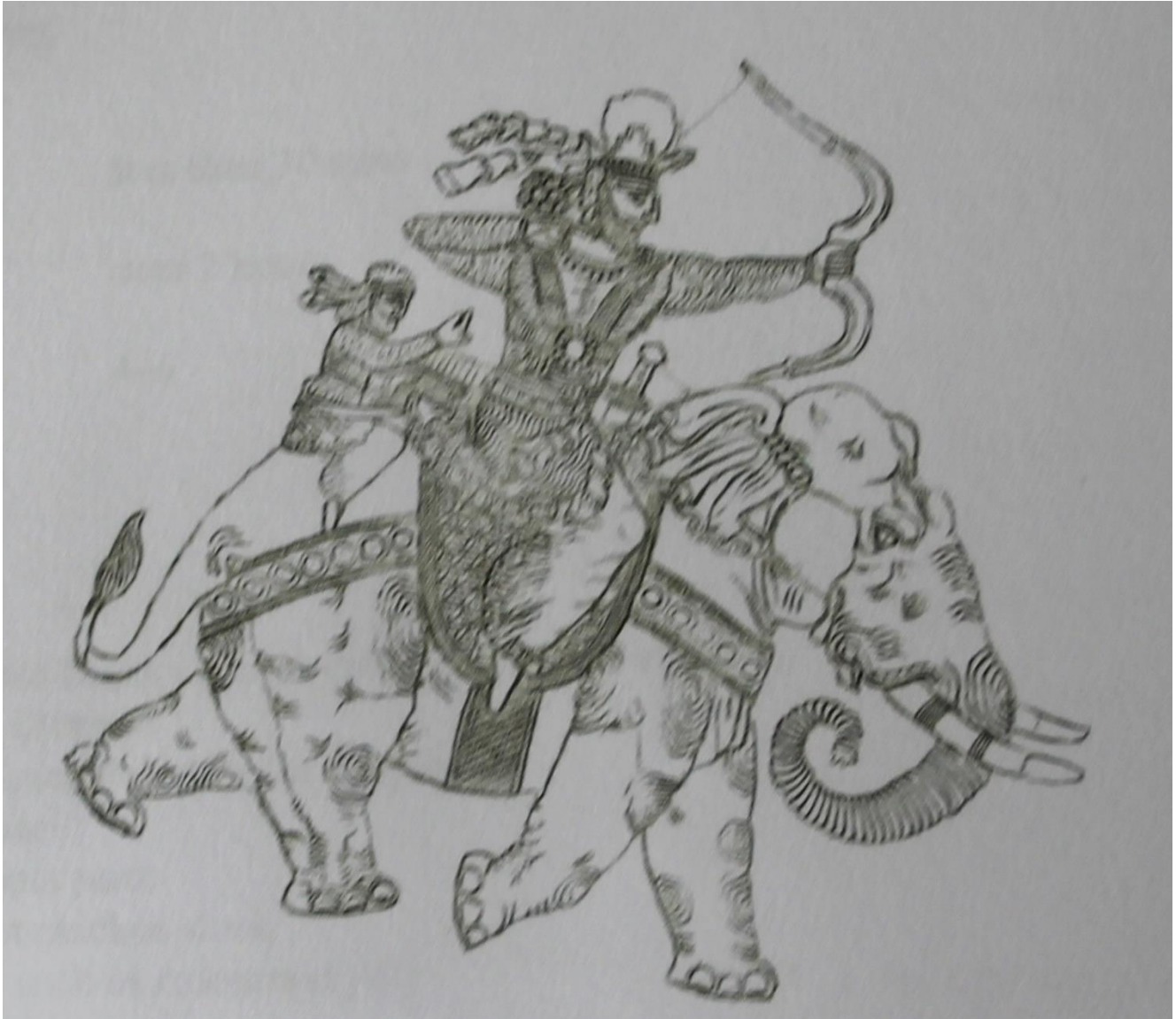


Figure 2. The Sasanian Emperor Shapur II (reigned fourth century CE) riding a war elephant (Original plate in Los Angeles County Museum of Art, inventory number M.76.174.18).

and Hozier, 1870).³

In preparation for the use of elephants totals of 263 maunds and 30 seer of coarse rice were shipped from Bombay to Abyssinia between 8 October 1867 and 15 January 1868 to provide food for them for a 2-month period.⁴ The daily allowance of water for each elephant

was 40 imperial gallons (181.8 L) and of food: gram 4 lb (1.81 kg), rice or flour 20 lb (9.07 kg), salt 2½ oz (56 g) and hay or kirben 175 lb (79.38 kg) (Holland and Hozier, 1870; Vol. 1, pp. 201, 214)

Transports (that is, ships) for all the constituents of the force and for stores of every description were gathered at Bombay. In order to be able to transport equipment and stores in the initial stages of the expedition and the heavy ordinance for the whole period a total of 44 elephants including both males and females was loaded in Bombay with one mahoot and one cooly attached to each elephant. It was intended to embark the elephants by

³The guns eventually used were breech loading rifled "Armstrongs manufactured for a 12-lb shot although other Armstrongs fired shot from as little as 9 lb to as much as 110 lb.

⁴A maund was a unit of mass in India which generally comprised 40 seer. Although the actual mass of a maund varied across the country the maund in this case was probably the standard Bombay one of 82.28 lb (37.32 kg) with a seer weighing 2.057 lb (0.93 kg). Introductory Notes to the Imperial Gazetteer of India, Vol. 2, p. vii. <https://dsal.uchicago.edu/reference/gazetteer/pager.html?objectid=DS405.1.I34>

_V02_007.gifth (accessed 28 July 2020). The total weight of rice thus transported was 9,943 kg.



Figure 3. Loading elephants by means of slings onto ships at Bombay.
 Source: British Battles.com, Magdala. <https://www.britishbattles.com/abyssinian-war/battle-of-magdala/>
 (accessed 29 July 2020).

means of shear legs but this proved impossible so they were hoisted up in slings (Figure 3). On board, the elephants were put in the hold on a temporary floor of stones and shingle arranged back to back with their heads facing the ship's sides. Stall breadths were 6 feet (1.83 m) divided by two cross beams resting on a longitudinal shelf fastened to the ship's side by cleats located along the side (Holland and Hozier, 1870).

On 6 January 1868, 19 elephants inbound from Bombay were landed in good condition at Zula. Good condition they may have been in but they were not unloaded without considerable difficulty. It had first been intended to sling them over the side of the ship and then let them swim to the shore but it was realized that it would be difficult to get the slings off in the water. It was decided to sling them into a barge instead. This was eventually successful but took time as the elephants were recalcitrant about the slings (having experienced them when lading). According to a report by the Special Correspondent of *The Standard* (a war correspondent "embedded" in the Expedition) there were further problems at the landing dock when the elephants refused to cross the landing platform until eventually, and after

having been given time for their own inspection, they crossed sedately onto dry land (Henty, 1868).

Towards the end of January a further 25 elephants were landed. All 44 animals were first employed in transporting stores before the railway became operational from Zula towards Kumayli which was the first way point on the route. This was only temporary work, however, as they had been sent to Abyssinia with the express purpose of transporting the heavy ordnance comprising four 12-pounder Armstrong guns of G Battery, 14th Brigade, Royal Artillery and two 8-inch mortars manned by a detachment of the 5th Battery, 25th Brigade, Royal Artillery. The mortars were to be packed on elephants from Zula all the way to Magdala whereas the Armstrong guns would be hauled to Antalo and thence packed by elephant. Four elephants were required for the transport of each gun and its attachments and a further three elephants were needed to carry the carriage wheels or 19 elephants in all (Table 1) (Holland and Hozier, 1870).

It proved impracticable to use shears for loading as the animals would not remain quiet under the fall. The method used, with the elephant couched, was thus to use a single skid for the gun and two skids for the carriage

Table 1. Details of elephant loads and their weights for transport of Armstrong guns.

| Elephant load | Item and weight (lb) ^a | Total weight (lb) | Total weight (kg) |
|---------------|---|-------------------|-------------------|
| Gun | Gun (924), cradle (150), pad and strapping (500) | 1574 | 714 |
| Carriage | Carriage (966), cradle (150), pad and strapping (500) | 1616 | 733 |
| Ammunition | 2 boxes (510), 1 wheel (314), pad and strapping (500) | 1324 | 601 |
| Wheels | 3 wheels (942), pad and strapping (500) | 1442 | 654 |

^aSome weights estimated by the Arsenal in Poona.

Table 2. Details of elephant loads and their weights for transport of 8-inch mortars.

| Load | Item and weight (lb) ^a | Total weight (lb) | Total weight (kg) |
|--------|---|-------------------|-------------------|
| Mortar | Mortar (924), travelling bed (168), cradle (252), pad + strapping (500) | 1844 | 855 |
| Bed | Iron bed (840), travelling bed (168), cradle (252), pad + strapping (500) | 1760 | 798 |

^aSome weights estimated by the Arsenal in Poona.

with one end resting on the ground and the other on the cradle (that is, the pack saddle). For the gun the breech-screw was removed and handspikes inserted in the bore at both breech and muzzle, the gun then being lifted along the spar by eight men until it rested in the cradle. A rope was also attached to the gun trunnions and passed over the cradle to be pulled on the other side by three or four men which also kept the gun steady while the lift men took a new grip. As the carriage was heavier 12 men were needed for the operation. The limber was lifted up directly without skids and a single wheel was tied on top. On the ammunition elephant one box was carried in a sling on each side and a wheel was tied on top of the pad. On the wheel elephant one wheel was slung on each side and one tied on the top (Holland and Hozier, 1870).

Two elephants were needed to carry each of the two 8-inch mortars and their beds. These weighty machines meant that elephant loads (one for the mortar and one for the bed) were slightly heavier than the ones carried by the Armstrong gun elephants. The weights of skids, implement boxes, handspikes and other equipment were not known but they were a good load for a single elephant. Powder was carried on another elephant (four shells were carried on mules). In total, therefore, six elephants were required to transport the mortars (Table 2) (Holland and Hozier, 1870).

To load the mortars, the elephants were couched, two parallel skids were placed with their upper ends resting on the cradle and their lower ends on the ground, the two being kept parallel by iron stays. These skids had a groove along which the flanged iron trucks of the travelling bed ran. Tackle that was attached to the travelling bed passed over rollers fixed in the cradle and passed to the opposite side of the animal. It required four men with handspikes to heave the mortar or bed up to

the skid when the load was run up into its cradle by hauling on the tackle. The pad was prevented from moving while loading by a third shorter skid on the hauling side (Figure 4).

The pads were kept in place by passing a rope over them and round under the belly, that is, not a girth strap as would be the norm for horses. This arrangement caused serious chafing and the development of galls and sores from the friction created and the long working periods of 12 to 20 hours without relief. This situation led to the suggestion that in future use in mountainous country the pads should be fitted with breechings and breast-pieces which would more firmly fix the pad and thus prevent the load from slipping backwards on steep inclines (Holland and Hozier, 1870).

The British had taken the precaution of enlisting local chieftains, many of whom were in open conflict with Tewodros, as allies. The most powerful of these was Dejazmatch Kassai, the ruler of Tigray, whose base was at Adigrat.⁵ Napier halted in Adigrat where he was joined by several military units including G Battery, 14th Brigade, Royal Artillery. At this time the Abyssinians considered that elephants were untameable and refused to believe that they could be subordinated by man. The elephants' passage through the country was thus followed by crowds of the local populace goggling in awe at the spectacle. Two elephants were brought to be shown to Kassai at a meeting that was to be held between Napier and Kassai on the road from Adigrat to

⁵Dejazmatch was an Abyssinian military title for the commander of the central body of a traditional Ethiopian armed force composed of a vanguard, main body, left and right wings and a rear body and equivalent in some respects to a European "Count" or "Earl" in British usage. Dejazmatch Kassai was issue of several ruling families in Tigray and was in revolt against Emperor Tewodros II in 1864-1867. On the death of Tewodros he united all the Provinces of Ethiopia and was crowned King of Kings Emperor Yohannes IV.



Figure 4. The 8-inch mortar being loaded on to an elephant.
Source: *The Illustrated London News*, 1 August 1868.

Antalo. Napier mounted an elephant and had a second follow him as he rode out to meet Kassai, the elephant being used to impress on Kassai the strength and power of the British. Before the actual meeting, however, Napier got down from the elephant and mounted his horse, “lest the approach of the huge earth-shaking beast should create a panic and cause disaster among the cavalry of Tigré” (Holland and Hozier, 1870). Probably in order to titivate the British public one war correspondent described Napier as sitting on a “large elephant decked in holiday ribbons and trappings followed by another and his staff and a select body of cavalry” (Stanley, 1874).⁶

If two elephants had caused a sensation when Napier met Kassai the local people were in for another shock. This was the arrival of the Armstrong guns and their passage from Senafe to Adigrat. A sensation, second only to that caused by the elephants, was created by the arrival of the battery of Armstrong guns. It had been thought doubtful as to whether it would be possible to get guns, at this stage hauled by horses and pushed by men, over the very difficult road between Senafe and Adigrat. The gunners did achieve the task but only with considerable difficulty (Holland and Hozier, 1870). In the meantime the two 8-inch mortars were ordered to go

forward, escorted by a couple of units of Indian troops, and left Senafe on 29 February together with 40 elephants (Holland and Hozier, 1870).

With most of the force and transport animals at Antalo, preparations began in earnest for the assault on Magdala. The Pioneer Force was sent two days ahead to improve the tracks and make them passable by the elephants. The 8-inch mortars and the elephants for the Armstrong Battery, escorted by Indian troops arrived at Antalo on 11 March: they had with them 50,000 dollars for various expected purchases (Holland and Hozier, 1870).⁷

By the evening of 14 March the road had been cleared sufficiently to allow orders to be sent back to Antalo that the Armstrong Battery of Artillery now loaded on the elephants should move up to the front. Ashangi was reached in the evening of 23 March without accident t o

⁶Henry Morton Stanley (the “man who presumed” who he met David Livingstone on the shores of Lake Tanganyika was a Special Correspondent of the *New York Herald* and one of several journalists of well known newspapers accredited to the Expedition.

⁷The “dollar” here referred to was the Maria Theresa dollar or thaler. This was the only monetary medium trusted (and even then not always) by the Abyssinians at the time. It is difficult to assign an accurate value to it. The expedition did buy, however, this silver coinage at a rate of 2.18 Indian rupees to the dollar, see Holland and Hozier (1870); Vol 1, p. 146. There were approximately 4 rupees to the pound sterling (£) (Indian Rupee, https://www.wikiwand.com/en/Indian_rupee) so 50,000 dollars would have a value of £27,250: in 2020 numbers this would be equivalent to £3,101,713.16 (US\$3,897,674.79) on 19 July 2020. A thaler weighed about 28 g and according to Richard Pankhurst (1968) *An Economic History of Ethiopia, 1800-1935*. Addis Ababa, Haile Sellassie I University Press a load for a mule would be not more than 2000 pieces which would be about 56 kg for each of the 25 mules required to carry the money.



Figure 5. The Chetta Ravine, Abyssinia.

Source: Watercolour by Lieutenant Frank James, Bombay Staff Corps, 1868, National Army Museum.

the men or damage to the guns after nine days of trek and forced marches from as early as 7.30 a.m. to 11.00 p.m. In addition to the elephants 154 mules were need to carry rations for 30 days and spare ammunition for the gun and mortar crews (Holland and Hozier, 1870).

One of the newspaper correspondents wrote that the elephants, fed 35 lb (15.9 kg) of bread and 40 lb (18.1 kg) of straw or coarse hay, toiled labouriously on the steep hills (Figure 5). An ascent of 1500 feet (457 m) had them puffing and trumpeting that were eloquent of their suffering. On moderate roads, however, they carried their 1800 lb (816 kg) with ease and made excellent time. Some of the older elephants “were a great deal larger than the renowned Hannibal of Barnum” but most were comparatively young and were less subject to fatigue

than their seniors (Sanley, 1874).

On 1 April 1868 the 2nd Brigade of the 1st Division of the Expeditionary Force was at Gahso, one day’s march to the west of the major camp at Santara at an altitude of 2,996 m. The 1,749 troops belonged to various cavalry, sapper, miner and infantry units and included 92 men with the Armstrong guns and 35 with the mortars (Holland and Hozier, 1870). On 6 April the Armstrong battery made a steep ascent to the top of the plateau. The elephants carrying the guns were exhausted and, when they were halfway up, and there was a violent storm of rain and hail, they refused to move until it had abated. They then tackled the second half of the incline when it rained again and there was another delay. Two elephants threw their loads, a now common occurrence, but when

the rain stopped the loads were quickly strapped on again. The rain had made the road very slippery but the elephants kept going slowly and by about 4 a.m. only eleven had not yet reached the top. As the leader was about to step on to the comparatively level ground her feet slipped she slid down about 50 or 60 yards (46-55 m) but she stopped without going over the side. She was unloaded but she refused to stand and the others now refused to move. All were unloaded and there was then a wait until the track dried. Fresh elephants were brought out from the camp, the battery arriving at its destination at about noon having struggled without rest since 8 a.m. the previous morning. Most of the captives were released on the evening of 12 April. On the morning of 13 April a senior commander of Theodore was shown the mortars and the elephants before he was allowed to return to Magdala and was told that the arms used in the action of the previous evening were like toys when compared to these armaments. Napier assured him that if Theodore did not surrender the big mortars and the Armstrongs would be brought in to action (Holland and Hozier, 1870). Both the guns and the mortars were deployed on the morning of 13 April and placed where they could give long range cover to the troops storming the fortress but it was found that they were largely ineffective as the range to the fortress was too far, at 2,400 yards (2,194 m), for their throw (Markham, 1869).⁸

Theodore and his commanders attempted a stalwart defence of his citadel and tried to make use of his own enormous canon. When defeat became inevitable Kassai himself refused to surrender and committed suicide. The British army hacked and mutilated the Abyssinians and burned their houses. Abyssinian treasures including precious and unique manuscripts and religious icons were looted. Looting was part of the culture at the time and loot was usually auctioned and the moneys shared amongst the troops, officers and other ranks (Pankhurst, 1985). The spoils were first transported on 15 elephants and almost two hundred mules to a nearby Dalanta Plain. One of the principal buyers at the 2-day auction was the British Museum whose representative had enough money to outbid most of the opposition (Stanley, 1874).⁹

The elephants and heavier ordnance were ordered to return north and commenced their journey on 21 April. Shortly after the fall of Magdala two elephants had died from exhaustion as they had been deprived of their proper forage and were often short of water: one of these was disposed of by throwing its carcass down the ravine.

⁸Markham was an Assistant in the India Office in London who was attached to the Expedition in the Scientific Department as Geographer. He was one of several people who were of or travelled with the Expedition to “cash in” on his experiences. There are very few references to elephants in his book and these have obviously all been taken from the official account.

⁹Much of the loot is still to be found in many European museums in spite of many Ethiopian requests for its return. The remains of Prince Alemayehu, a son of Theodore who was taken to Britain after the battle and who died in 1879, are still buried at Windsor Castle in spite of multiple requests that they be returned to Ethiopia.

Three others died at Bulago about 150 miles (241 km) north of Magdala. The return march from Magdala “was a work of no slight difficulty”.

Most of the elephants were now very tired. There was none to replace those that broke down and in such a situation the beast had to be left with his load until it recovered or until another one could be sent back from the camp to bring the load in. Throughout the march 26 non-commissioned officers and men were directly employed with 29 elephants the others being employed to guard the baggage. That 18 men were needed to unload a gun carriage gives an indication of the work that had to be done every day unloading and loading. In addition there were numerous occasions during the course of the trek when the guns were taken to pieces and put together again to be hauled a short distance by the mules (Holland and Hozier, 1870). The elephant party did not arrive at Antalo, a distance of 196 miles (315 km) until 10 May, three weeks after its departure from Magdala. On reaching Antalo the Armstrongs were put back on their carriages and hauled the rest of the way to Zula by mule or horse teams. Most of the elephants were then walked down to Zula unladen (Holland and Hozier, 1870).

The work of loading the elephants onto the ships for the return journey to India appears to have been simpler than the arrangements at their arrival in Abyssinia. Large iron barges were used that were admirably adapted for the job: these would hold any of 300 men, 120 mules, 60 Cavalry men and their horses and eight to ten elephants. G Battery, 14 Brigade Royal Artillery with six European Officers, 48 European troops, 120 followers, seven horses and 77 mules left Zula for Bombay on 28 May. A total of 17 elephants were loaded on the sailing vessel Compta with 22 loaded on the sailing vessel Hahneman: both ships left Zula on 31 May, bound for Bombay, each with one European Officer in charge and supporting, mainly Indian, troops (Holland and Hozier, 1870; Vol. 2, pp. 108-111).

Conclusions

Elephants carried the entire mortar battery from Zula to Magdala and the Armstrong guns with their carriages, limbers, ammunition and other bits of equipment from Antalo to Magdala, and doing the same on the return journey, over extremely difficult and mountainous country. Providing them with suitable forage was no easy matter and the difficulty of obtaining water for them, especially at Magdala, certainly contributed to the loss of the five animals that died. It was said that they “did their work well in carrying, as they did, loads varying from 8 to 16 cwt (406 to 812 kg) each and without them it would have been impossible to have taken the heavy guns and mortars to Magdala, unless very considerable delay had taken place in making roads fit for wheel carriage” (Holland and Hozier, 1870).

At the conclusion of operations the Commander-in-Chief Lieutenant-General Sir Robert Napier wrote a series of despatches to the Secretary of State for India. In Despatch No. 6 dated 1 June 8 he wrote:

*Elephants have frequently been employed for the transport of artillery in Indian warfare, but it has been generally by means of draught; when guns have been carried, it has only been for short distances. It has been the privilege of this campaign to prove that elephants could carry Armstrong 12-pounder guns and 8-inch mortars over steep mountains for many hundreds of miles. There were 42 elephants employed in the conveyance of ordnance and ammunition, and of these five have been lost from hard work and want of water during the operations before Magdala (Holland and Hozier, 1870).*¹⁰

The achievements of the elephants can probably be described as magnificent. It needs to be remembered, however, that there were only 44 of them and they did not all reach Magdala. In contrast, the Expedition's Transport Train on the day that Magdala was captured numbered 7,365 camels, 11,155 mules, 1,708 ponies, 6,922 pack bullocks, 901 draught bullocks, 784 donkeys 305 mule carts, and 345 bullock carts (Holland and Hozier, 1870). The contribution of the elephants to the overall transport operations was thus extremely small. In addition, what should have been their major contribution, landing artillery shells and mortar bombs on the Magdala fortress, did not materialise as neither guns nor mortars could get close enough to the intended target to achieve that goal.

As Napier indicated, the expedition had proved that elephants could be used to carry heavy loads over long distances over extended time periods. The main outcome, however, may have been the impression they created in the local populations that the Invading force was something to be feared not only because of its size and organization but also because it was using some kind of magic that allowed it to have power over elephants and bend these formidable creatures to its will.

Postscript

The Abyssinian Expedition has received approbation from many and varied sources since it was mounted more than 150 years ago. It is regarded as a military operation that was well planned, well organized, well executed, integrated various arms of the military and that achieved its objectives with a minimum loss of human life on the British side (Bates, 1979).

The Expedition has been described as "an enormous

undertaking, in size, in duration, and in financial cost.

Essentially a hostage rescue operation, it is one of the classic examples of combined expeditionary warfare" (Ashcroft, 2001). It has also been depicted as "one of the most expensive affairs of honour in history" (Marcus, 1995).

With regard to its cost a best estimate of the expense is eight million pounds sterling at 1868 prices. This is roughly equivalent to £ 910,594,688.60 or US\$ 1,172,030,976.67 in 2020 values.¹¹ All 59 hostages (a baby was born the next day to make the total 60) were released on 12 and 13 April 1868 and were transported out of the country although several returned there at a later date. The unit cost of rescuing a hostage, not necessarily for the sole benefit of the one person but for the pride of the British Empire, was thus £ 15,433,808 (US\$ 19,864,931).

CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

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¹⁰Note the error in this Despatch where Napier states there were 42 elephants whereas 44 was the actual number.

¹¹<https://www.in2013dollars.com/uk/inflation/1868?amount=8000000>

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