

OCCASIONAL PAPERS ON METEOROLOGICAL HISTORY No. 19

How Europeans experienced and observed the climate of the Kenya highlands before the establishment of the British East African Meteorological Service in 1929

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Published by
THE ROYAL METEOROLOGICAL SOCIETY
Specialist Group for the History of
Meteorology and Physical Oceanography

November 2020

ISBN - 978-1-80049-029-1

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Abbreviations used

- BEAMS British East African Meteorological Service
- KNA Kenya National Archives
- KNADS Kenya National Archive and Document Service

Map

1. The Kenya Highlands

Acknowledgements & author's note

The help and support of the following are gratefully acknowledged: David E. Pedgley for his very helpful comments on the draft; the late J. Malcolm Walker, Editor when this paper was proposed; the Bodleian Library of Commonwealth and African Studies at Rhodes House, Oxford (the collection is now housed in the Weston Library); the British Library; the British Library Newspaper Collection (previously held at Colindale and now at Boston Spa); the Royal Commonwealth Society Collection held by the Cambridge University Library; Durham University Library; Durham University Department of Geography and Chris Orton in the Cartographic Unit; the Foreign and Commonwealth Library (now held by King's College, London); Harris Manchester College, Oxford; Kenya National Archive (now the Kenya National Archive and Document Service) Nairobi, the McMillan Memorial Library, Nairobi; the National Meteorological Library and Archive, Exeter; the Wellcome Library, London.

The author wishes to pay tribute to the late Elspeth Buxton, who, many years ago, unearthed material used in this paper in the library and archives of the School of Geography when it was in Mansfield Road, Oxford, and to record her gratitude to her friend, the late Peter Brown, for encouraging her to finish this paper. She graduated in 1955 from St Hilda's College, Oxford, in Honours Geography with the Henry Oliver Beckitt Prize and held a Leverhulme Overseas Research Scholarship at Makerere College, Uganda, and the East African Agricultural Research Organisation, Kenya, from 1956 to 1958. She continued to visit the region at frequent intervals. She held temporary posts at St Hugh's College, Oxford, and Bedford College, London, before posts at Liverpool University, 1960-77, and Durham University, 1977-1999. She has been a member of Council of the Institute of British Geographers, the African Studies Association of the UK and the Royal Meteorological Society, visiting lecturer at the University of Dar es Salaam, Tanzania, at Fourah Bay and Njala Colleges, Sierra Leone, and at Witwatersrand and Fort Hare Universities, South Africa. During the preparation of this paper, she has been an Honorary Research Associate of the Department of Geography, Durham University, an Honorary Fellow of Harris Manchester College, Oxford, and a member (and former committee member) of the History Group of the Royal Meteorological Society. In 2015, she was awarded the Jehuda Neumann Memorial Prize of the Society for her work on the history of meteorology.

1. Introduction

We have a climate which may be described as glorious, but it requires a lot of understanding ... one district may be quite suitable for one product, but a couple of miles further on the conditions are quite different. There is an absence of data; everybody has to garner his own experience (and pay for it) before he can tell what his own district is best suited for ... (*The Times of East Africa*, Saturday, March 24, 1906).

The majority of our pioneer settlers took up land in and around Nairobi district and, in the absence of data, their early attempts at agriculture seem to have been almost entirely of an experimental nature, resulting in many instances of costly individual trials (Department of Agriculture, Nairobi, Report for 1913-14).

In the highlands you woke up in the morning and thought: Here I am, where I ought to be (Karen Blixen, 1937¹)

1.1. European settlement in the Kenya Highlands

From 1902, parts of the highlands of the British East African Protectorate, now known as Kenya,² were scheduled for European use under colonial legislation (Map 1).³

Recognition that the climate above 5,000 feet (approximately 1,500 metres) would be pleasant and healthy for Europeans had encouraged the belief that a European farming economy⁴ might create trade to help make the so-called Uganda railway pay.⁵

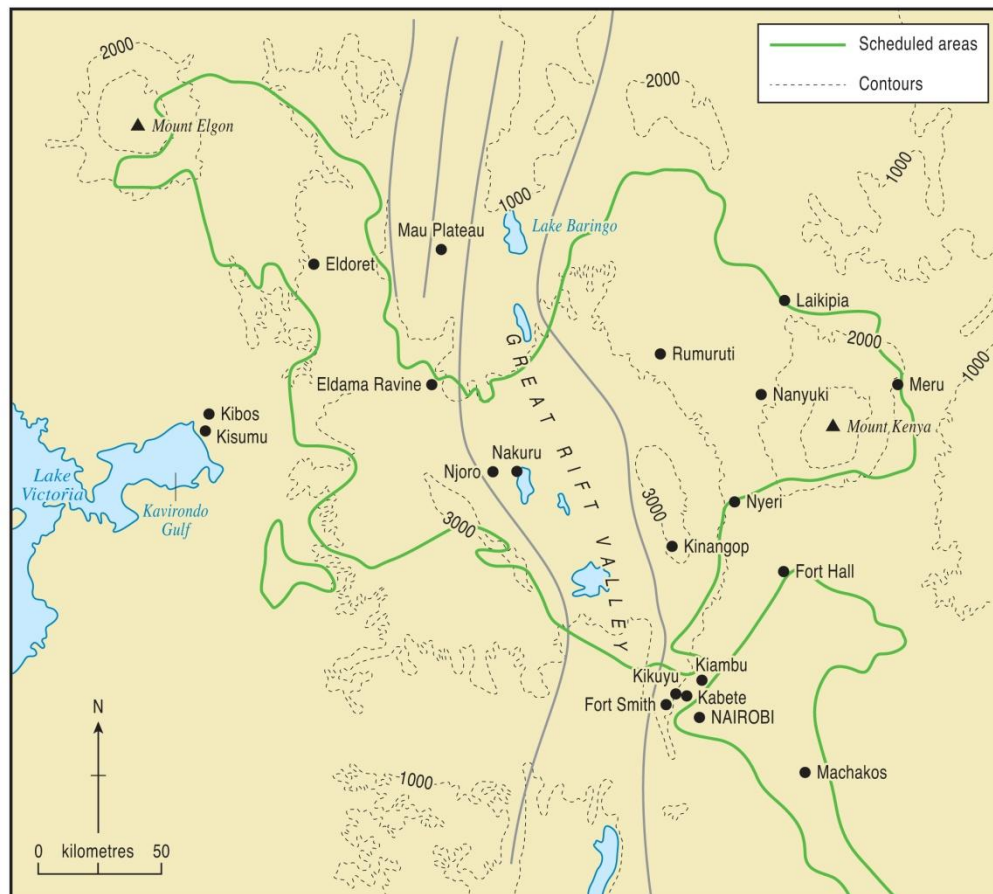
¹ Blixen, K., 1937. *Out of Africa*, Published in Penguin Books, 1954, 14.

² What is now known as Kenya was managed by the Imperial British East Africa Company from 1888 to 1895, after which it was taken over by the British Government as the British East Africa Protectorate. In 1920, it became a British Crown Colony, known as the Colony and Protectorate of Kenya. Kenya became independent of British rule in 1963.

³ The British believed that much of the land in the highlands was not used by indigenous peoples, although Sir Charles Eliot was greatly criticised for granting Masai land to Europeans and shifting Masai back and forth – a particularly tragic episode (See Morgan, W. T. W., 1963. The 'White Highlands' of Kenya, *Geogr. J.* **129**: 140-155). Stories of the 'Happy Valley' set obscure the fact that many of the settlers who recorded their memoirs convey a broader image of successes and failures. Details of the settlers are available in: Hutchinson, T. H., 2006. *Kenya Up-country Directory, containing the names of the Europeans who have lived and worked in up-country Kenya*, Edition 2, Gilgil; *Tribute to Pioneers: Mary Gillett's index of many of the Pioneers of East Africa*, Published privately, Oxford: J. M. Considine; Huxley, E. and Curtis, A., 1980. *Pioneer Scrapbook: reminiscences of Kenya 1890-1968*, London: Evans Brothers Limited; Trzebinski, E. 1985. *The Kenya Pioneers*, London: Heinemann; Sunman, H., 2014. *A very different land. Memories of Empire from the farmlands of Kenya*, London: The Radcliffe Press.

⁴ For details on the development of that economy, see: Huxley, E., 1948. *Settlers of Kenya*, Nairobi: Highway Press & London: Longmans Ltd.; Hill, M. F., 1956. *Planters' Progress, the story of coffee in Kenya*, Nairobi: The Coffee Board of Kenya; Hill, M. F., 1958. *Cream Country, the story of the Kenya Co-operative Creameries Limited: twenty-five years of progress*, Nairobi: Co-operative Creameries; Huxley, E., 1957. *No easy way. A history of the Kenya Farmers' Association and Unga Limited*, Nairobi: East African Standard Ltd.; Cone, W. and Lipscomb J. F. (Eds.), 1972. *The history of Kenya agriculture*, Tavistock & Nairobi: University Press of Africa; Wolff, R. D., 1974. *Britain and Kenya, 1870-1930: The Economics of colonialism*, Nairobi: Transafrica Publishers.

⁵ The railway, sometimes referred to as 'the lunatic line', was planned as a step towards stopping the slave trade from Uganda to the coast and ensuring British control of the headwaters of the Nile (in competition with the French). Hill, M. F., 1949. *Permanent Way: the story of the Kenya and Uganda Railway*, Nairobi: East Africa Literature Bureau.



Map 1. The Kenya Highlands, provided by the Cartographic Unit, Department of Geography, Durham University. Place names on the map are colonial, but indigenous names are added in the text.

Paradoxically, some studies have given climate as one of the reasons why it was difficult for the first European settlers to succeed. P. Mosley wrote:

In the early period (up to 1920) white farmers in the settler economies [Mosley included *Southern Rhodesia* in his study] faced a climatic regime so unprecedented elsewhere in the world - a year divided into distinct rainy and dry periods at a high altitude in the tropics - that there was no bank of available research experience to tell pioneer farmers what crops would grow well in what locations with what treatments, and which implements would be appropriate to the conditions.⁶

⁶ Mosley, P., 1986. *The settler economies. Studies in the economic history of Kenya and Southern Rhodesia 1900-1963*, African Studies Series 35, Cambridge University Press.

When looked at historically, European occupation of Kenya was of short duration and how a people learned to understand the climate of a new environment before the establishment of a meteorological service (BEAMS) in 1929⁷ can be explored without the need to comment on its inappropriateness as seen from a present day perspective.

European experience can be traced through letters, diaries and reports deposited in Rhodes House under the Oxford Colonial Records Project and subsequently transferred to the Weston Library, Oxford. Other material can be found in the Royal Commonwealth Society collection in the Cambridge University Library, in East African newspapers held by the British Library and in the Kenya National Archive and Document Service in Nairobi.

The highlands of Kenya comprise a remarkable combination of physical features, mostly of volcanic origin. Land rises from the coast over a distance of approximately 440 kilometres to Nairobi at 1,795 metres (5,889 feet). To the north-northeast of Nairobi is Mount Kenya (Kirinyaga): 5,199 metres (17,057 feet) at its highest point. The Aberdares (Nyandarua) reaching 3,999 metres (13,120 feet) form the eastern part of an uplifted mass divided by the Rift Valley, sometimes known as the Gregory Rift, in which lie a number of lakes. The highlands are bounded to the west by Mount Elgon (Wagagai), which reaches its highest point in Uganda at 4,321 metres (14,177 feet), and to the south by the Kavirondo (Winam) Gulf of Lake Victoria (Victoria Nyanza). The elevation of the lake is often quoted as 1,133 metres (3,717 feet), but variations in lake levels have caused interest and concern over many decades.⁸

1.2. The highland climate

The climate may be temperate, but it is quite different from the temperate climates of high latitudes. The length of day varies little through the year, the diurnal range of temperature exceeds the seasonal range whatever the altitude and there is little variation in temperature from year to year. There are small differences in the rates of change of temperature with height between the eastern and western highlands.⁹ Karen Blixen leaves no doubt as to the effect of altitude and night time temperature inversions on the coffee she planted from 1913 at her farm close to the Ngong Hills:

My farm was a little too high up for growing coffee. It happened in the cold months that we would get frost on the lower land and in the morning the shoots of the coffee-trees, and the young coffee-berries on them, would be all brown and withered. The wind blew in from the plains, and even in good years we never got the same yield of coffee to the acre as the people in the lower districts of Thika and Kiambu, at four thousand feet.¹⁰

It was the variations in rainfall amount from year to year, however, that caused the most anxiety for the settlers.

⁷ Kenworthy, J. M., 2014. Albert Walter, O.B.E. (1877 – 1972), Meteorologist in the Colonial Service, Part II: First Director of the BEAMS, first President of the IMO Regional Commission No. 1 (Africa), Group Captain in the Second World War, advisor on meteorology to the Groundnut Scheme, *Royal Meteorological Society Occasional Paper* 13.

⁸ See footnote 44.

⁹ Glover, J. and Kenworthy, J. M., 1957. Effect of altitude on the temperature and dew point of the air, *Record of Research 1956-1957*, East African Agricultural and Forestry Research Organization (EAAFRO), East African High Commission: Nairobi: 18-19. 1958. Kenworthy, J. M., 1966. Temperature conditions in the tropical highland climates of East Africa, *E. Afr. Geogr. Rev.* 4: 1-11; Kenworthy, J. M., 1969. Classification of tropical highland climates, *Contrib. to P. Jaganathan and S. P. Das Gupta (Eds.), Symposium on tropical climates*, Poona, India, *21st International Geographical Congress Proceedings*, 5-10.

¹⁰ *op. cit.* 1. 275.

In a year in which we had fifty inches of rain, we picked eighty tons of coffee, and in a year of fifty-five inches, nearly ninety tons; but there were two bad years in which we had only twenty-five and twenty inches of rain, and picked only sixteen and fifteen tons of coffee, and those years were disastrous for the farm.¹¹

R. Van Zwanenberg suggested that some of the problems might have been eased if the settlers had made more effort to absorb local knowledge,¹² but, as indicated by Eastwood, effort was made to learn from local people:

Amongst the natives of this part of the country there is a tradition that there is a cycle of 9 or 10 years, each of which cycles terminates with a drought. Our records do not go back far enough to prove whether there is any truth in the tradition or otherwise, but the information we possess as to what took place for 2 or 3 years previous to June 1899 is certainly in favour of such a tradition. The years 1898 and 1899, commonly spoken of as the 'Famine Years', were not absolutely rainless, but the rains failed in the same manner that they did in 1908 and 1909, ten years later (Eastwood, 1910).¹³

1.3. The rainfall regimes¹⁴

Examples of rainfall regimes are given in Appendix 2 for *Nairobi*, *Eldoret* and *Nanyuki*, based on mean values for the first international standard 30-year period, 1931-1960, being the first period providing reliable values systematically collected and checked by the BEAMS and its successor the East African Meteorological Department.¹⁵

In the eastern highlands and the southern parts of the Rift Valley, as seen in the example of *Nairobi*, the long rains, associated with a south-easterly monsoon, generally occur during March to May and the short rains, associated with a north-easterly monsoon, occur during October to December. This regime is conventionally described as resulting from the seasonal shift of the Intertropical Convergence Zone, north and south, and is related to monsoonal changes over the Indian subcontinent.

By contrast, the rainy season in the western highlands and the higher part of the Rift Valley around Nakuru is prolonged by westerlies drawn across the highlands by the summer monsoon and uplifted by the high ground. In that region, the main rains continue from April to August, though with a tendency for a drier June, as seen in the example of *Eldoret*. Comparatively weaker short rains occur toward the end of the year.

¹¹ Ibid.

¹² Van Zwanenberg, R., 1972. *The agricultural history of Kenya to 1939*. Historical Association of Kenya, Paper no. 1, Nairobi: East African Publishing House; see also Van Zwanenberg R. M. A. with King, A., 1975. *An Economic History of Kenya and Uganda, 1800-1970*. Atlantic Highlands: Humanities Press.

¹³ Eastwood, B., 1910. The rainfall of Nairobi. *The agricultural journal of British East Africa*, III: 126-129. See also Lumb, F. E., 1972. Rainfall at Machakos, Kenya 1896-1971, *Weather* 27: 333-335, and Kenworthy, J. M., 1995. Climate in the Kenya Highlands from the late nineteenth century, *Journal of the African Meteorological Society* 2: 105-106. Also of interest is *Kenya, its industries, trade, sports and climate*, Kenya Empire Exhibition Council, Published for the British Empire Exhibition, 1924, which, in a section on Climate in Kenya, includes the comment that 'Road transport during the "heavy" rains proves difficult and is sometimes dislocated, but a spirit of adventure, supported by the latest information, always available from the Royal East African Automobile Association, generally "gets you home".'

¹⁴ Kenworthy, J. M., 1984. Climatic survey in the Kenya Highlands with particular reference to the needs of farmers, Contribution to Lauer, W., Natural Environment and Man in Tropical Mountain Ecosystems, *Erdwissenschaftliche*, Stuttgart: Franz Steiner, 21-29; Kenworthy, Joan M., 1994. An historical data set for Kenya, Brazdil, R. and Kolar M., 1994. *Contemporary Climatology*, Brno. See also relevant material held in the Public Records Office, London, and current work on the climate of Kenya and the wider region of East Africa listed in the online catalogue of the National Meteorological Library.

¹⁵ East African Meteorological Department, 1966. *Monthly and annual rainfall in Kenya during the 30 years, 1931 to 1960*, Nairobi: East African Common Services Organization.

Rainfall maps of the African continent show the mid-year rains to be a south-eastward extension of the zone of rainfall shifting northwards and southwards across Africa with the seasons.¹⁶

A third type can be recognised to the north of Mount Kenya (Kirinyaga) and the Aberdares (Nyandarua), as seen in the example of *Nanyuki*, where year to year variability is considerable, the longer rainy season being experienced in some years, but a distribution nearer to the long and short rains regime in others.

The long and short rains regime of the eastern highlands is so well known to those who visit Nairobi that it is often quoted as the rainfall regime typical of Kenya. It is, however, an anomalous regime, which, together with the dryness of eastern Kenya, needs explanation.¹⁷ As the south-east monsoon traverses inland from the coast, it recurves north and eastwards to join the Indian summer monsoon.¹⁸ Its consequently divergent character brings about stable air, stratus cloud and drizzle or light rain over the montane and bamboo forests of the Aberdares (Nyandarua) and Mount Kenya (Kirinyaga). East of the highlands (and inland from the wetter coastal zone) rainfall values for July, August and September never exceeded 50 mm. in the period from 1931 to 1960.¹⁹ Locally, the dry, cloudy and relatively chilly weather experienced in Nairobi during July is often described as 'winter', when there has been known to have been only one hour of sunshine in a day at Nairobi. This dry period occurs consistently from year to year, but, quite differently, the dry period at the turn of the year is variable. In most years, little or no rain occurs in January, but in some years the so-called short rains continue into January and February across both the western and eastern highlands (Appendix 3). Such weather is influenced by the El Nino Southern Oscillation (ENSO)²⁰ and the Indian Ocean Dipole,²¹ though not all such episodes bring heavy rain to Kenya.

As early as 1978, R. C. Hills recognised 'organised' areas of convective rainfall in East Africa²² and later work has defined such areas as sub-synoptic disturbances, representing a small number of rainfall events yet contributing up to 75% of annual

¹⁶ Davies, T. D., Vincent, C. E. and Beresford, A. K. C., 1985. July-August rainfall in West-Central Kenya, *Journal of Climatology* 5: 17-33. The wetter August pattern was also identified by C. E. P. Brooks, 1924. The distribution of rainfall over Uganda, with a note on Kenya Colony, *Q. J. R. Met. Soc.*, 50: 325-38; Rodgers, J. A., Dennett, M. D. and Stern, R. D. write of the Perkerra Irrigation Scheme, in the Rift Valley to the north of Nakuru: 'The main rainy months are April, May, July and August ... and there does not seem to appear to be a distinct dry season', Rainfall at Perkerra, Report no. 4, Tropical Agricultural Meteorology Group, Department of Agricultural Botany and Applied Statistics, University of Reading. E. Powys Cobb refers to her father's farm near Molo, 'where the 'big rains' were in May. June and July and 'small rains' in March', Reminiscences by a daughter on life as a farmer in Kenya, *Bodleian MSS. Afr. s. 2058*.

¹⁷ Glenn T. Trewartha looked into the anomalous dryness of eastern Africa, Trewartha, G.T., 1961. *The earth's problem climates* (Second Edition 1981), The University of Wisconsin Press, 134-158.

¹⁸ Slingo, J., Spencer, H., Hoskins, B., Berrisford, P. and Black, E., 2005. The meteorology of the Western Indian Ocean, and the influence of the East African Highlands, *Phil. Trans. A. Math Phys. Eng. Sci.* 363: 25-42.,

¹⁹ op.cit. 14. Kenworthy, 1984.

²⁰ Omondi, P., 2013. Linkages between global sea surface temperatures and decadal rainfall variability over Eastern Africa region, *Int. Jnl. Clim.* 33: 2082-2104.

²¹ Owiti, Z., Ogallo, L.A. and Mutemi, J., 2008. Linkages between the Indian Ocean Dipole and East African seasonal rainfall anomalies, *J. Kenya Meteorol. Soc.* 2: 3-17.

²² Hills, R. C., 1978. The organisation of rainfall in East Africa, *J Trop Geogr.* 47: 40-50. See also Hills, R. C., 1979. The structure of the Inter-Tropical Convergence Zone in Equatorial Africa and its relationship to East African rainfall, *Trans. Inst. Brit. Geogr.*, 4: 329-352.

rainfall.²³ It has also been suggested that topography contributes to the generation of convective rainfall and mesoscale and sub-synoptic disturbances.²⁴

2. Exploration and survey

2.1. Ventures into the interior

Climatic conditions at the coast of Africa were known to the Portuguese and other Europeans from the fifteenth century, but it was not until the mid-nineteenth century that German Lutheran missionaries of the Church Missionary Society, Johann Ludwig Krapf (1810-1881) and Johannes Rebmann (1820-1876), began to travel inland, having previously collected information from Arab traders. Rebmann described seeing snow on Kilimanjaro on 11 May, 1848,²⁵ and Krapf gave an account of his sighting of snow on the peaks of Mount Kenya, or 'Kimagu Kegnia' (now Kirinyaga), on 3 December, 1849:

As the rainy season had already set in, the region about the Kegnia was enveloped in cloud. However, it happened that on leaving Kitui on the 3rd December, 1849, I could see the Kegnia most distinctly, and observed two large horns or pillars, as it were, rising over an enormous mountain to the north-west of Kilimanjaro, covered with a white substance.²⁶

Disagreement about the likelihood of 'snow on the equator'²⁷ soon took on a fascination for the 'armchair' geographers of the Royal Geographical Society - in a similar way to later speculations about the source of the Nile. Doubt arose from failure to accept the heights of Kilimanjaro and Mount Kenya, for, as Krapf pointed out, it was well known that there was snow on the equatorial Andes. Justice should have been given to the ability of Krapf to write vivid and accurate descriptions of a place or region.²⁸

In a foreword to the account by Krapf, E. G. Ravenstein referred to the discovery of mountains covered with perennial snow as

... a discovery which can only be denied if we assume the missionaries capable of deliberately advancing false statements.

It is no wonder that Krapf reacted to the criticism of his reports with a determination to get on with his work and 'Let geography perish'.²⁹ Rebmann simply pointed out that, having lived in Switzerland, he was well able to recognise snow.

Information about the East African interior continued to be collected by missionaries such as Thomas Wakefield, who joined Krapf at Ribe near Mombasa in 1862³⁰ and, in

²³ Dezfuli, A. K. *et al.*, 2017. Precipitation characteristics in West and East Africa from satellite and in situ observations, *Jnl of Hydrometeorology* **18**: 1799-1805.

²⁴ Ogwang, A. B. *et al.*, 2014. The influence of topography on East African October to December climate, *Advances in Meteorology*, **2014**, 14 pages,

²⁵ Rebmann, J., 1849-50. Journal of a journey to Jagga, *Church Missionary Intelligence* **1**: 13-23.

²⁶ Krapf, J. L., 1860. *Travels, researches and missionary labours during an eighteen years' residence in Eastern Africa*, Second Edition with a new introduction by R. C. Bridges, London: Frank Cass, 1968.

²⁷ For an examination of the controversy and the part played by W. D. Cooley, see Bridges, R. C., 1976. W. D. Cooley, the RGS and African geography in the nineteenth century, *Geogr. J.* **142**: 27-47, in particular pages 40-41.

²⁸ *op. cit.* **26**. His description of the Jaggai [Chagga] district of Kilimanjaro, for example, is recognisable to anyone who has known the area in later times.

²⁹ *Ibid.* Bridges, R. C., Introduction.

1864, J. Kirk wrote on the meteorological observations made by Dr. Livingstone's Zambezi expedition.³¹ Mean monthly rainfall values for Mombasa from 1875 were published in 1882, compiled from daily observations made by an agent of the Church Missionary Society³² and, in 1884, a rainfall map of Africa by A. K. Johnston showed a dry strip inland from the East African coast. Johnston's accompanying notes referred to the dependence of the rainfall seasons on changes of the monsoon.³³

2.2. A Scot admires the highland environment

The contribution made by missionaries to 'geography, geology, botany and meteorology' was acknowledged by Joseph Thomson (1858-1895) in his account of an expedition to East Africa from 1878 to 1880.³⁴ His account of a second journey across the highlands west of Mount Kenya from 1883 to 1884 brought the climate of the equatorial highlands dramatically into focus for geographers in Britain.³⁵

Travelling inland from Mombasa, Thomson noted the sharp line between regions, such that a mid-year drought prevailed inland at a time when rain fell on the coastward fringe, but he also noted that drought was 'unknown' at altitudes between 6,000 feet (1829 metres) and 8,000 feet (2438 metres). He thought that the Wakikuyu must lead a trying life at high altitudes, north of the present Nairobi,

where the temperature in the dry season ranges from below freezing point to nearly 90°; while in the more unpleasant wet season ranges from 50° to 95° [10 to 35°C] - though owing to the excessive moisture it *feels* both colder at the lower and warmer at the higher temperatures than in the dry season.

He wondered whether a change in temperature or alteration of the rainfall might account for dead trees at Gilgil in the Rift Valley.³⁶ He observed the misery of the Masai from the surrounding plains, the absence of rain and loss of cattle in the low-lying districts having caused them to stay in the 'cold bleak highlands'. He noted the severity

³⁰ Rev. Thomas Wakefield (1836-1901). Obituary: The Rev. Thomas Wakefield, *Geogr. J.* **19**: 224-225, 1902; Wakefield, E. S., 1904. *Thomas Wakefield, Missionary and geographical pioneer in East Equatorial Africa*, London: The Religious Tract Association. Wakefield's weather diary for 1876-7 is available in a report of the Tyneside Naturalists' Field Club held in the National Meteorological Library and Archive: Wakefield, T. 1876-77. Private weather diary for U.M.F.C. Mission Station, Ribe, Kenya, Africa, Latitude 3 degrees 52 minutes South, Longitude 39 degrees 9 minutes East.

³¹ Sir John Kirk GCMG KCB (1832-1922); see Kirk, J., 1864. Explanation of meteorological tables illustrating the climate of East Tropical Africa, *Proc. Br. Met. Soc.* **II** (14): 222-235.

³² Twigg, R. H. 1882. Rainfall of Frere Town, Mombasa, 1875-1881, *Q. J. Met. Soc.* **VIII**: 1881-1882.

³³ Johnston, A. K., 1884. *Africa, Revised and corrected by E. G. Ravenstein, Stanford's Compendium of Geography and Travel*, Tenth Edition, London: Edward Stanford. A. K. Johnston died in 1879 leading a RGS expedition (his father, Alexander Keith Johnston, 1804-1871, had published a physical atlas in 1848 and was awarded a medal at the 1851 Exhibition for his physical geography globe). See McCarthy, J., 2004. *Journey into Africa: The Life and Death of Keith Johnston, Scottish Cartographer and Explorer (1844-79)*, Caithness: Whittles Publishing, which also includes a description of Joseph Thomson's background and education.

³⁴ Thomson, J., 1881. *To the Central African Lakes and back. The narrative of the Royal Geographical Society's East Central African Expedition, 1878-1880*. Second Edition, with a new introduction by Robert I. Rotberg, London: Frank Cass, 1968. Thomson took charge of the expedition after the death of A. K. Johnston. See also, for an assessment of Thomson's achievements, Rotberg, R. I., 1971. *Joseph Thomson and the exploration of Africa*, New York: Oxford University Press.

³⁵ Thomson, J., 1885, Second Edition, 1887. *Through Masai Land. A journey of exploration among the snowclad volcanic mountains and strange tribes of Eastern Equatorial Africa. Being the narrative of the Royal Geographical Society's expedition to Mount Kenya and Lake Victoria Nyanza, 1883-1884*. Second Edition, London: Sampson Low, Marston, Searle & Rivington.

³⁶ Thomson was not the only European to visit the Rift Valley in the 1880s. Dr. Gustav Fischer, supported by the Geographical Society of Hamburg, reached Naivasha from the south in 1882.

of occasional hail storms. He danced with 'patriotic enjoyment' at the sight of 'an unmistakable Scotch mist' at 8,400 feet (2560 metres). He described a 'winter scene' on the Aberdares following a thunderstorm with hail and his 'supreme satisfaction' when he saw grass covered with hoar frost. He noted the limited times of rainfall occurrence. He recognised the relative dryness of the Laikipia plateau.

Thomson thought about the significance of lower temperatures for health and added a note to the 1887 edition of his narrative that

... it only remains for the commercial world, seeking new fields and new outlets for trade, to open up its eyes to the extreme fertility of the soil – and for Africa – salubrity of the climate ...³⁷

Commenting at the end of Thomson's narrative, Sir John Kirk noted how favourably the climate of the highlands compared with climate elsewhere in Central Africa.³⁸ Even so, Thomson argued³⁹ against those who advocated colonisation.⁴⁰ He suggested that the highlands were only '*comparatively* healthy' and 'by no means a place where people of European origin could live or bring up families'.⁴¹

It seems that altitude had become another factor to consider with caution at a time when it was thought that the hot wet climate in West Africa was to blame for fever and death.⁴² The view 'at home' continued for many years to be one fearful of tropical climates. A sardonic note in *The Times of East Africa* of 21 July 1906 referred to the cost of maintaining the Colony to the British taxpayer:

If people at home had any idea that the Equatorial Africa of these plateaux is a white man's world of the most attractive kind, deficits would be replaced by revenue advancing by leaps and bounds. But at home the idea of Equatorial Africa is malaria tempered by mosquitoes.

2.3. Unseasonable rains and the cold at high altitudes

Possibly the first account of so-called unseasonable rains in East Africa, when the short rains continued into January and February (See Appendix 1), is found in Frederick (later Lord) Lugard's account⁴³ of a journey across the highlands from the end of 1891 to the first months of 1892.

³⁷ op. cit., 35.

³⁸ Kirk, Sir John, Britain and Germany in East Africa, Note at the end of Thomson, op. cit. 35.

³⁹ Thomson, J. 1886. Contribution to discussion: Can Europeans be acclimatised in tropical Africa? Report of the Proceedings of the British Association Birmingham meeting, *Proceedings of the Royal Geographical Society*, New Series, VIII: 727-745.

⁴⁰ M. P. K. Sorrenson and R.D. Wolff suggest that uncertainties about the East African environment also had political implications: was there to be a temperate colony, which would be self-governing like Australia, New Zealand, or South Africa, or, since the coastlands of Kenya seemed admirably suited to it, a tropical plantation colony, where European planters were but temporary residents without political control? Sorrenson, M. P. K. and Wolff, R. D., 1974. *Britain and Kenya, 1870-1930. The economics of colonisation*, Nairobi: Transafrica Publishers: 68-71. See also Sorrenson, M. P. K., 1968. *Origins of European settlement in Kenya*, Memoir number 2, British Institute of History and Archaeology in East Africa, Nairobi: Oxford University Press.

⁴¹ Thomson, J., 1886. East Central Africa, and its commercial outlook, *Scottish Geog. Mag.* 2: 65-78.

⁴² See, for example, Curtin, P. D., 1964. *The image of Africa. British ideas and action, 1780-1850*, Madison: University of Wisconsin Press. Ronald Ross was to identify the transmission of the malaria parasite by mosquitoes in 1897. See also Livingstone, D. N., 1992. Mortality and migration: the Acclimatisation question, *The Geographical Tradition*, Oxford: Blackwell, 232-241.

⁴³ Lugard, Captain F. D., 1892. Travels from the East Coast to Uganda, Lake Albert Edward and Lake Albert, *Proceedings of the Royal Geographical Society*, XIV: 817-841.

Usually in this part of Africa the lesser rains begin early in October and cease in the middle of December ... Last October and November the lesser rains were unusually heavy, and continued with little intermission till the time of the regular rains in March ... We did not leave this zone of rain, or the rains did not cease (I know not which), till we descended from the Mau plateau at the end of July ... the Lake Victoria was some 6 feet perhaps above its ordinary level, and may probably rise still higher.⁴⁴

Major James Macdonald also records a journey across the highlands from Naivasha to Lake Victoria and back in the first half of 1892, when undertaking a preliminary survey for the projected Uganda railway.⁴⁵ The party experienced rain almost every day and damp cold at 8,000 feet (2438 metres). He wrote that 'the unfortunate porters felt it more than we did, and one poor fellow died of pneumonia'. J. W. Gregory also reported heavy rains in 1892, so heavy in the Njemps district of the Rift Valley (around Lake Baringo) that crops and soil were washed away. There had been little rain and crops had failed in the previous year.⁴⁶

The cold at high altitudes was again emphasised in 1895. A station report for Eldama Ravine told how, in the absence of their commander, thirty men died, having sold the cloth that had been supplied to them for warmth to Kikuyu earlier on the expedition.⁴⁷

Unseasonably heavy rains occurred again in 1896-7. Survey and railway construction was beset by rain, which continued from November to January. In 1898, the main rains failed and the drought was not broken in the Ukamba district (near Nairobi) until the end of 1899, after which rain continued into 1900 and floods damaged railway installations.⁴⁸

⁴⁴ The rise in the level of Lake Victoria in the early 1960s was shown to be related to heavy rain in the west Kenya highlands in a similar way to the circumstances identified by Lugard in the 1890s. Mörtz, H. 1965. (Investigations into the meteorological aspects of the variations in the level of Lake Victoria. Unpublished internal report of the East African Met. Dept., Nairobi: 335-344) was only one of a considerable number of publications on rises in the lake level. Ravenstein, E. G. 1901. The Lake-Level of the Victoria Nyanza, *Geogr. J.*, **18**: 403-406. C. E. P. Brooks related variations in lake levels to sunspots and evaporation (Brooks, C. E. P., 1923. Variations in the levels of the central African lakes Victoria and Albert', *Geophysical Memoirs* **2** (20), Air Ministry, Meteorological Office, London: HMSO), but the relationships he saw were considered spurious by H.E. Hurst (Hurst, H. E. 1952. *The Nile: a general account of the river and the utilization of its waters*, London: Constable, 264). See also: Lamb, H. H., 1966. Climate in the 1960s, changes in the world's wind circulation reflected in prevailing temperatures, rainfall patterns and the levels of African lakes, *Geogr. J.*, **132**: 183-212; Indeje, M., Semazzi, F. H.M. and Ogallo, L., 2000. ENSO signals in East African rainfall seasons, *Int. J. Climatol.* **20**: 19-46; Mistry, V. V. and Conway, D., 2003. Remote forcing of East African rainfall and relationships with fluctuations in levels of Lake Victoria, *Int. J. Climatol.* **23**: 67-89; Stager, J. C., Ruzmaikin, A., Conway, D., Verburg P. and Mason, P. J., 2007. Sunspots, El Nino, and the levels of Lake Victoria, East Africa. *Journal of Geophysical Research* **112**: 13; Hydrometeorological survey of the catchments of Lakes Victoria, Kyoga and Albert, Inauguration, 22nd March, 1968, Entebbe, Uganda; Weather Guide, *Reporter*, East Africa's Fortnightly Newsmagazine, Vol. IV: 32-33.

⁴⁵ Macdonald, Major J. R. L., 1897. *Soldiering and surveying in British East Africa, 1891-1894*, London: Dawsons of Pall Mall, (with a new Introduction, 1973). Survey for the 'Uganda' railway began in 1892.

⁴⁶ Gregory, J. W., 1896. *The Great Rift Valley. Being the narrative of a journey to Mount Kenya and Lake Baringo*, London: John Murray. Gregory noted how variations in vegetation reflected differences in rainfall between windward and leeward slopes, and noted a zone of maximum rainfall between 7,000 and 11,000 feet (2134 and 3353 metres). See also Powell, J. M., 2015. John Walter Gregory, 1864-1932., *Geographers Biobibliographical Studies*, 23, Bloomsbury Academic.

⁴⁷ Ravine Station Diary (Jan. 1895 - July 1900), *MMS Afr. s 1397*, Rhodes House, Oxford, now in the Weston Library. The National Meteorological Library and Archive holds Climatological returns for Eldama Ravine, 1901-1903, ARCHIVE Z18.K1-Z17.C3.

⁴⁸ op. cit., 5.

2.4. Were the Kenya Highlands suitable for European colonisation?

Speculation continued about the suitability of the highland climate for white settlement. For example, Lugard described the rushing streams of the highlands and the sheltered bays of the lakes as affording picturesque glimpses of scenery similar to those found in Scotland. He added that 'as you scale the hills, with the cold wind in your teeth, you will feel the same bracing atmosphere'.⁴⁹ Calling for an experiment in European colonisation, he allowed that there was still some doubt whether the highlands would prove a suitable place for the rearing of white children, but argued that:

The Shire Highlands [in present day Malawi] though only at an average elevation of 3,000 feet [914 metres] have proved healthy to Europeans. Should it appear that the nearer the Equator the healthier that locality – given sufficient altitude to ensure the requisite climate – a point will have been established which may revolutionise our ideas of the Dark Continent, and transform its history.

Gregory was in no doubt that Europeans could live in equatorial Africa, but questioned whether there would be sufficient temptation for them to do so in large number,⁵⁰ and In 1897, Dr. Carl Peters told the Society of Arts that 'the African climate on the hills and plateaus above 1,200 metres (3937 feet) is agreeable and suitable for the European', but contrasted the temperate climate of tropical high mountains with the seasonal climate of high latitudes, suggesting that the extreme diurnal oscillation of temperature in the tropical highlands might have an effect on the nervous system.⁵¹ He recognised that the risk of disease was meant when reference was made to the dangers of the African climate and that in due course disease might be conquered. Meantime, the Scottish geographer, J. Scott Keltie⁵² advocated a series of carefully conducted experiments in settlement, claiming that the weight of evidence already suggested that it would never be possible to colonise, although white men taking due precautions could no doubt live and work in tropical Africa.⁵³

Quite different views came from those with first-hand experience! Captain Sclater, who led the construction of a road across the Rift Valley, noted that immense crops of potatoes were grown in the Kikuyu district, where 'the climate, according to the testimony of the Europeans who live there, is extremely healthy'.⁵⁴ He also commented on the land-use potential of areas of the Rift Valley and plateaus.⁵⁵

Doubts continued despite the growing confidence of Europeans living in the highlands. On 28 July 1906, *The Times of East Africa* included 'An American Appreciation of East Africa':

⁴⁹ op. cit., 43.

⁵⁰ op.cit. 46. Gregory's report on the geology, natural history and anthropology of East Africa included a masterly review of the history of exploration in the region. .

⁵¹ Peters, Dr. Carl, 1897. The future of Africa. Lecture delivered to the Society of Arts on March 5th, 1897. London: Waterlow and Sons.

⁵² Scott Keltie, J. 1897. Some geographical problems. Presidential address to Section E at the Toronto meeting of the British Association, August 1897, *Geogr. J.* X: 308-323.

⁵³ M. P. K. Sorrenson and R.D. Wolff suggest that uncertainties about the East African environment had also had political implications: was there to be a temperate colony, which would be self-governing like Australia, New Zealand, or South Africa, or, since the coastlands of Kenya seemed admirably suited to it, a tropical plantation colony, where European planters were but temporary residents without political control? Sorrenson, M. P. K. and Wolff, R. D., 1974. *Britain and Kenya, 1870-1930. The economics of colonisation*, Nairobi: Transafrica Publishers, 68-71. See also Sorrenson, M. P. K., 1968. *Origins of European settlement in Kenya*, Memoir number 2, British Institute of History and Archaeology in East Africa, Nairobi: Oxford University Press.

⁵⁴ Sclater, Captain B. L. 1895. The new road from Mombasa to the Victoria Nyanza, *Geogr. J.* VII: 662.

⁵⁵ Sclater, Captain B. L. 1897. The road to the Victoria Nyanza, *Geogr. J.* IX: 89-90.

There is one question which can be applied to but few thoroughly tropical regions, but which is of utmost importance for the future of East Africa. Is it what is generally called a 'white man's country' – that is to say a land where the white man, and in particular the Anglo Saxon, can not only live himself, but rear children that will not degenerate? East Africa is situated directly on the equator, and the low-lying coast is obviously unsuitable for the reproduction of the white race as it is anywhere else in the same latitude, but the interior is made up of mountain and plateau, several thousand feet above sea level. To be sure, there is no winter but the nights are cool; ideal if you go high enough up, really cold.

3. The beginning of organized observations

3.1. Responsibility for meteorological observations in the colonies.

A network of meteorological observing stations in British held territories had been authorized by Major-General Sir John Fox Burgoyne and responsibility for making observations given to officers of the Royal Engineers under Captain Henry James.⁵⁶ Instruments and instruction manuals were supplied and, in 1875, R. H. Scott of the Meteorological Committee edited *Instructions in the use of meteorological instruments*⁵⁷ (precursor to the *Observer's Handbook*), which may have reached observers in Africa in later years. In 1892, responsibility for making observations in East Africa was given to officers of the Imperial British East Africa Company, although elsewhere responsibility was transferred to senior members of the Army Medical Department.

No meteorological records for East Africa are included in an 1890 report of the Meteorological Council,⁵⁸ but C. H. Crawford, an official of the British East Africa Company, extracted some rainfall values⁵⁹ and G. J. Symons published data for East Africa in the *Meteorological Magazine* and *Nature*.⁶⁰

3.2. The British Association for the Advancement of Science.

In 1891, a committee was set up at the Cardiff meeting of the British Association for the Advancement of Science to investigate the Climatological and Hydrographical conditions of Tropical Africa (in effect East Africa). The committee was awarded an initial grant of

⁵⁶ Captain Henry James, RE. Member of the Meteorological Society (later Royal), delegate to the Brussels conference of 1853 and Fellow of the Royal Society.

⁵⁷ Scott, R. H., 1875. *Instructions in the use of meteorological instruments, compiled by direction of the Meteorological Committee*, London: J.D. Potter for HMSO.

⁵⁸ Meteorological Council, 1890. *Meteorological observations at foreign and colonial stations of the Royal Engineers and the Army Medical Department, 1852-1886*, London. HMSO & Eyre and Spottiswode.

⁵⁹ Ravenstein, E. G. 1894. *Report on Meteorological Observations in British East Africa for 1893*. Published by the authority of the Directors of the Imperial British East Africa Company, London: George Philip; Howarth. O. J. R., 1931. *The British Association for the Advancement of Science: a retrospect 1831-1921*, Centenary (Second) Edition. London: British Association; Macleod, R. M., Friday, J. R. and Gregor, C. 1975. *The Corresponding Societies of the British Association for the Advancement of Science. 1883-1929. A Survey of Historical Records, Archives and Publications*, London: Mansell; MacLeod, R. M. and Collins, P. D. B., 1981. The Parliament of science: the British Association for the Advancement of Science 1831-1981, London: Science Reviews Ltd.

⁶⁰ See Symons, G. J. 1893. Colonial meteorology. Letter, *Nature* **47**: 390.

£75 of which £50 was claimed.⁶¹ Members of the committee were E. G. Ravenstein (Chairman),⁶² G. J. Symons and Baldwin Latham (Secretary). Dr. H. R. Mill and H. N. Dickson, who later replaced Baldwin Latham as Secretary, were added to the membership in 1895. Sir John Kirk joined the committee in 1896.

A pamphlet entitled *Hints for meteorological observers in tropical Africa, with instructions for taking observations*⁶³ was prepared and a report, published in 1894, summarized observations up to 1893. The East African highlands were represented by Machakos (Machakos DC Office, 1646 m., 5400 ft.) and Fort Smith, near the present Kikuyu (Kikuyu Station, 2079 m., 6818 ft.). Other stations were at or near the coast. Temperature, rainfall and other data were recorded at five stations for at least one year, rainfall observations only at four coastal or near coastal stations. Included in the report were an abstract of observations made in 1891 by Sergeant W Balance, R.E. and a table summarising 'leading climatological facts from 23 stations in East Africa with data for Cape Town, Greenwich, Vienna and Rome as standards for comparison'. Unfortunately, the accuracy of the data was questioned:

There is reason to believe that some of the results are seriously affected by instrumental errors.

The formation of 'means' presented some difficulty owing to the unsuitable hours selected for observation.

Ravenstein drew attention to the tropical nature of the highland climate:

In a country the mountains of which pierce the region of perennial snow, it would be easy to find stations, the mean temperature of which would be the same as that of any town in Europe. But as mean temperature is not the only, nor the most important factor, which distinguishes a tropical climate from the climate of our temperate regions, it would be rash to conclude from this that these upland stations would be suitable for European 'colonists'. No elevation above the sea level is capable of obliterating those distinguishing features of a tropical climate – a small annual range and a great daily range of temperature – whose influence upon the well-being of Europeans cannot be understated [*sic*]. At Machakos's [*later known as Machakos*], which seems in many respects the most favoured station occupied by the Company, the mean temperature is only 65°; the extremes recorded vary between 48° and 81°. This range, however, would have been much more considerable had the maximum and minimum thermometers been available. At Fort Smith, in Kikuyu, the mean temperature is still less, whilst the range is nearly the same. At all these stations the daily range seems to approach if it does not exceed 20°F., which is nearly double of what is experienced at Greenwich.

Ravenstein described the climate of Fort Smith as exceptionally well suited to European residents.⁶⁴ Gaps in observations, faulty exposure of instruments and other problems were listed, but positive news was that the Committee had granted a complete set of instruments, including a mercurial barometer presented by the Meteorological Council, to Scottish missionaries at Kibwezi on the road from Mombasa to Machakos. The return

⁶¹ Further grants were awarded. £50 in 1892; £10 in 1893 (not paid); £5 in 1894; £10 in 1895; £20 in 1896; £10 in 1897, Withers C. W. J., 2010, *Geography and science in Britain, 1831-1939. a study of the British Association for the Advancement of Science*, Manchester University Press: 72-73.

⁶² Ernst Georg Ravenstein, 1834-1913, *Geographers: Bibliographical Studies* 1.

⁶³ *Hints to meteorological observers in tropical Africa, with instructions for taking observations*, Prepared by a Committee of the British Association for the Advancement of Science, 1891, London, 1892; Also Ravenstein, E. G., Latham, Baldwin, and Symons, G. J., 1892. The climate of tropical Africa, *Symon's Monthly Meteorological Magazine*, 64 and Hints to Meteorological Observers in Tropical Africa with Notes on Methods of recording Lake Levels. Published by the Authority of the Meteorological Council, HMSO: London, 1902.

⁶⁴ The climatology of Africa (The Monthly Record, Africa), a note on the Fourth Report of the British Association Committee on the Climatology of Africa. 1893. *Geogr. J.* VI: 385-386.

from Kibwezi for 1897 was described as by far the most complete received from British East Africa. Elsewhere, Ravenstein summarised the rainy seasons as ‘the lesser beginning in the middle of October or early November, and lasting four to six weeks; the greater beginning in the middle of March, and lasting for two months’.⁶⁵

When W. W. A. Fitzgerald asked permission to include data in his book on East Africa, Ravenstein replied: We are anxious that this information, collected at great trouble ... should be utilized, and by doing this you confer a favour.⁶⁶

In 1899, Sir Halford Mackinder sought advice on what observations of temperature and pressure to make on Mount Kenya. In reply, Ravenstein referred to the stations at Machakos and Fort Smith, but regretted that for some time no returns had been received from the missionaries at Kibwezi.⁶⁷ Rainfall amounts at Nairobi were reported for the first time in 1890 (for the last three months of 1889). The tenth and final report of the British Association committee was that of 1901.⁶⁸

3.3. Contributions by colonial officers: 1896-1900

Further information on meteorological observations made in East Africa before the end of the nineteenth century is found in the correspondence of the Provincial Commissioner at the Coast for period 1896 to 1900.⁶⁹

A letter from John Ainsworth at Machakos, dated 13 March 1896, refers to the import of plants from Australia for himself and Stuart Watts, a missionary. A subsequent letter, dated 29 April, refers to weather records:

Sir/

In accordance with instructions received from Her Majesty's Commissioner I have the honour to send you herewith the Meteorological returns in duplicate for Machakos and Kikuyu for the quarter ending 31st March 1896.

I have the honour to be Sir,

Your most obedient, humble Servant

John Ainsworth

Sub-Commissioner

Also in the Provincial Commissioner's correspondence is a Quarterly Report from the Acting District Officer of the Kenia [sic] District at Kikuyu, dated 1 July 1896, which includes a section on meteorology:

⁶⁵ Ravenstein, E. G., 1895. *Maps and climatological memoranda*, in J. Murray, *How to live in tropical Africa, a guide to tropical hygiene*, London: G. Philip.

⁶⁶ Fitzgerald, W. W. A., 1898. *Travels in the coastlands of British East Africa and the islands of Zanzibar and Pemba*, London: Chapman and Hall.

⁶⁷ Letter from E. G. Ravenstein, 2. York Mansions, Battersea Park, S.W., to H. J. Mackinder, June 1899, Western Manuscripts, Bodleian Library, Oxford, [formerly held by the School of Geography, University of Oxford]. Failure of the missionaries at Kibwezi to send a return was probably because, the site having been found to be unhealthy, the mission transferred to Kikuyu before 1900 (Somerset Playne, see footnote 88).

⁶⁸ The Climatology of Africa, Ninth Report, presented to the meeting of the British Association at Bradford in 1900; Tenth and Final Report, presented to the meeting at Glasgow in 1901.

⁶⁹ Provincial Commissioner's papers PC/Coast/1/1/31, KNA (now KNADS), Nairobi. Ainsworth was later the first Chief Native Commissioner, Maxon, R. M., 1980. *John Ainsworth and the making of Kenya*, Washington, D.C.: University Press of America. Note that the British Government took over the administration of the British East African Protectorate after 1895, op. cit. 2.

The greater rains which generally occur in the months of March, April and May have proved almost a complete failure this year. In fact at one time I apprehended a famine consequent on the anticipated failure of the crops, but a few showers of rain which passed at irregular intervals together with heavy nightly dews and a singularly cloudy atmosphere have served, fortunately, to avert the threatened catastrophe.

	Dry bulb thermometer	Wet Bulb	Rain gauge
April averages	67.43°	62.16	Totals 3.89
May	64.77	60.94	3.93
June	63.50	59.70	3.41
General averages	65.23	60.93	Gross total 11.23

Our heaviest day's rainfall occurred towards evening of the 15th ultimo, when 1.73 inches was recorded. The prevailing direction of the wind has been easterly.

The Quarterly report from Teita District, towards the coast, dated 30 June 1896, also includes comments on the shortage of rain, especially in the northern parts of the district where local peoples had been compelled to seek food from more favoured areas.

Owing to the scarcity of rain there is very little water to be had on the road, in fact from Taru to Voi there is none, and between Ndii and Tsavo and the whole country has a dried up appearance.

A report from Ainsworth was forwarded to the Acting Commissioner and Consul General at Mombasa on 12 September 1896, which notes failure of the rains in the Athi District near to Nairobi, although Ainsworth adds that food was fairly abundant in Kikuyu, uphill from Nairobi. Ainsworth forwarded returns for Machakos and Ndii (near to the coast) for July, August and September 1896. His return for September mentions a lack of water along the road and that the supply of grain was getting scarce.

Returns for the quarter ending 31 December 1896 for Kikuyu and Machakos were forwarded on 22nd January 1897 and included the news that smallpox had hit Voi, though Machakos had escaped. There had been no returns for Ndii, but returns for Machakos and Kikuyu, forwarded on 30 June 1897, included a comment that one for Ndii had already been sent. On 11 October 1897, Ainsworth sent thermometer and rainfall readings for Machakos and Kikuyu for the quarter ending 30 September. On 22 January 1898, he reported values to 31 December 1897. On 7 and 8 March 1898, he reported cattle disease (Rinderpest) in the Ulu District of Ukamba Province near to Nairobi.

In a letter to the Commissioner, dated 12 May 1898, Ainsworth wrote:

I have the honour to acknowledge receipt of your circular of the 11th April last relating to Meteorological returns, in reply I have to inform you as follows.-

I Instruments at Machakos and Kikuyu are read at 9 AM daily.

II At neither station is there any Barometer.

III We are unprovided with any instruments to record the direction of the wind, but a general observation will be made and recorded.

IV All returns are sent to you quarterly as soon as they are received by me.
Returns sent as follows.

July 27th 1898 for Machakos for quarter ending June 30th

25th for Kikuyu
21st October for Machakos
9th November for Kikuyu
10th February for Machakos to December 31st

I should be much obliged if you will have printed 500 forms in the manner that these are made up in and sent to me.

4. Experimental settlement 1899-1913

4.1. Developments along the railway

The headquarters of the railway moved from Mombasa to Nairobi in 1899. Most of the European residents in the British East African Protectorate at the time were missionaries, administrators, road and rail builders and members of the army, but, as construction of the railway continued beyond Nairobi, thoughts turned to the possibility of European settlement. There was cautious optimism. Sir Henry Colville wrote:

... the Mau plateau ... combining a bracing climate with tropical sunshine, plentiful water supply, lovely park-like scenery, and an almost endless extent of unoccupied grazing land, struck me as I passed through it as an ideal place of residence for anyone who wished to live a wild healthy life, subsisting on his gun or the product of his flocks and herds, though, as far as I could see, not one in which he would be likely to make a fortune.⁷⁰

A leading settler, Lord Delamere, established Equator Ranch, near Njoro, where he set out to farm sheep on Australian lines from 1901.⁷¹ The story is often told how his sheep died from a mineral deficiency in the soil, how he transferred sheep to the Rift Valley near Elmenteita, how he imported cattle, but they were struck by East Coast Fever, and that he grew wheat at Njoro, and, when that was attacked by a fungal infection known as rust, he brought a scientist to help him evolve a strain from imported varieties that were immune. As was written in a handbook of 1950:⁷²

Lord Delamere was not, of course, typical of the Kenya pioneers, most of whom had comparatively small estates, well under 1,000 acres. They had neither his financial resources, nor his big ideas.

The area between Nairobi and the Kikuyu escarpment was identified in a 1902 report to Parliament as the most attractive from a settler's point of view.⁷³ In addition to mission settlements, eight or ten Europeans were already occupying and cultivating land in a 'climate that is excelled by probably no other in the world, wherein a white man can not only live in comfort, but work in comfort'. The report referred to admirable water

⁷⁰ H. E. Colville, Notes on Uganda, National Archives, Kew. Major-General Sir Henry Edward Colville (1851-1907) was appointed Acting Commissioner of Uganda in 1893. He was involved in the Unyoro (now Bunyoro) expedition of 1895.

⁷¹ Huxley, E., 1935. *White man's country: Lord Delamere and the making of Kenya*, London: Macmillan.

⁷² *Introducing East Africa*, London: HMSO, 1950. Breeding for resistance against rust continued for many decades: Pinto, E. F. and Hurd, E. A. 1970. Seventy years with wheat in Kenya, *E. Afr. agri. For. J.* **36**: Special Issue.

⁷³ Report on the agricultural prospects of the plateaux of the Uganda railway, by Mr. R. N. Lyne, Director of the Agricultural Department in Zanzibar. Diplomatic and Consular Reports, Cd. 787, No. 577, Miscellaneous Series, Africa, presented to both Houses of Parliament by Command of Her Majesty, July, 1902, London: H.M.S.O. (Historical Library of the Foreign and Commonwealth Office, Foyle Special Collections Library, King's College, London).

supply from streams flowing from northwest to southeast, but also to the risk of drought:

In times of extreme drought these streams are, I believe, liable to dry up. This took place in the famine three years ago, though I am told it is the only instance known to the inhabitants of the country.

The report points to the importance of ascertaining the distribution as well as the total fall of rain:

... while it has much in its favour, the Kikuyu has drawbacks. It has a somewhat deficient rainfall and the normal rains sometimes, though perhaps only at rare intervals, fail. I am informed that the last three years have been exceptionally dry. ...

An examination of the meteorological records, and a comparison of those years in which full monthly records have been kept, do not at first sight bear out the statement that the last three years have been exceptionally dry. Thus, at Kikuyu the total rainfall for 1896 was 31.19 inches; for 1897, 36.31 inches; and for 1901, 52.01 inches. There were, therefore, 15.70 inches of rainfall more in 1901 than in 1897. But a closer scrutiny of the figures discloses the fact that for five months, June – October, the rainfall in 1901 amounted to only 1.88 inches, while for the same period in 1896 it amounted to 8.88 inches, and in 1897 to 13.51 inches. So, although the total fall in 1901 was above average, the bulk of the rain (42.36 inches) fell in the four months, February to May, and during the five months following ... the drought.

Reference was made to well-watered country at Machakos and on the slopes of Kinangop on the eastern side of the Rift Valley - and the writer was optimistic about the potential of the Mau plateau to the west of the Rift Valley:

...judging by the rank vegetation ... the rainfall in the Mau forest was greater than in the Kikuyu.

... if ever clearing should begin the settler would soon follow, and he would find the favourable conditions of the Kikuyu multiplied in the Mau; a richer soil, an even more bracing climate, and I believe a higher rainfall.

The report discussed the possible cultivation of cereals, coffee and tea. That the seasonal distribution of rainfall on the Mau plateau differed from that to the east was not mentioned, but the report recognised that rainfall was generally deficient in the Rift Valley and on the westward-facing slopes to the Kavirondo (Winam) Gulf.

On 1 March 1906, Sir Charles Eliot closed a lecture, delivered at Aberdeen, by saying that the East African Protectorate was a country with a beautiful climate, where Europeans could live and find anything they required in the way of vegetables and meat to which they were accustomed in England.⁷⁴

In 1907, George Bransby Williams⁷⁵ called on the Protectorate Government to increase the number of rain gauges, particularly on both sides of the Aberdares, pointing out that it was important that rainfall was 'properly observed and recorded by an intelligent and trustworthy person'. He noted that rainfall records for Kikuyu and 'Mumia's' began as early as 1896, although there were gaps in both series, and that values varied considerably from year to year. He showed how the seasonal regimes at highland stations differed from those at the coast and explained that the wettest areas of the highlands were to the west of the Rift Valley, where rainfall was more evenly distributed through the year, when compared with Nairobi, where there was a long mid-year dry season.

⁷⁴ Reported in *The Times of East Africa*, Saturday, April 7, 1906.

⁷⁵ Williams, G. B., 1907. The Rainfall of the British East Africa Protectorate, *Geogr. J.* **29**: 654-660.

4.2. The Emigrants' Information Service

Although rainfall conditions to the west of the Rift Valley were described by writers such as George Bransby Williams - and earlier travellers such as Lugard - the different rainfall regimes remained obscure to the potential settler from Britain or elsewhere. The regime characteristic east of the Rift Valley became well known through its repeated inclusion in text books and guide books. The regime experienced to the west, with rains from April to August and less reliable short rains, was not generally reported.

A series of pamphlets of the Emigrants' Information Service⁷⁶ emphasised the wet seasons from March to May or June and November to December, adding that rainfall sometimes occurred in February. July, August and September were described as cold, dry months. That July and August were wet months in the western highlands was at first overlooked. Indeed, when reference was made to the potential for settlement on the western plateau, no information was given on the climate until 1904, when merely the mean annual rainfall for Nakuru was included (the railhead reached Kisumu on Lake Victoria in 1903).

The pamphlet for 1906 included mean, maximum and minimum temperature and annual rainfall values for Naivasha, Nakuru, Eldama Ravine and Molo, but made no mention of the August maximum at western stations. An official from South Africa, investigating the potential of the western highlands for Afrikaner settlement, described the climate as that of 'a perpetual English summer, with cabbages as big as bicycle wheels turning the scales at thirty pounds'.⁷⁷

By 1912, the Emigrants' Information Service pamphlet contrasted highland and lowland climates and included mean monthly rainfall for stations that showed the western rainfall regime, but the text failed to describe differences in the regimes, suggesting that the author leaned heavily on earlier versions. A telling comment was included:

Climatic conditions vary so enormously within such short distances that it is almost true to say that every district has a climate of its own.

Leaflets on the climate were also provided by the Department of Agriculture in Nairobi. One referred to August as a dry month, failing to point to August rainfall west of the Rift Valley.⁷⁸ Other publications included a series by the East African Agricultural and Horticultural Society, which provided settlers with summaries of meteorological data for several areas of the highlands.⁷⁹

4.3. Experimental farming

It seems that the European community in Kenya could not decide whether to focus on what they called the 'regular rains' or to rejoice that in some places rain could occur in any month. Either way, they were doomed to disappointment in particular years.

⁷⁶ General Information on the East Africa Protectorate, *Emigrants' Information Service Series*, 1902, 1904, 1906, 1908, 1911 and 1912, London: HMSO

⁷⁷ Huxley, E., 1957. *No easy way*, op. cit. 4. Afrikaner settlement in the Eldoret area began soon after the turn of the century with an increase in the number of arrivals from 1908.

⁷⁸ Department of Agriculture, 1905. *Meteorological condition*. Leaflet no. 11, Nairobi. British East Africa.

⁷⁹ East African Agricultural and Horticultural Society, *The East African Quarterly*, Nos. 1-15, January, 1904-September, 1907.

Fortunately, high prices for coffee and maize ensured that the 'years immediately preceding the First World War were years of rapid economic advance'.⁸⁰

On 6 January 1906, *The Times of East Africa* correspondent for Naivasha reported that

The short wet season here usually is of short duration with but slight rainfall or none at all. This year, however, it has extended over several months culminating during the last week or two in heavy rain flooding the storm water channel called by courtesy the creek lying half-way between the township and the Government Farm, a condition at this season of the year hitherto unknown.

On March 3 1906 a further note on the weather showed that the normal seasonal regime was understood - as well as its variability:

The long wet season began here in the middle of March last year being comparatively early ...it may be judged that it has already commenced, being a month earlier than last year. As the last short wet season was protracted over several months, the intervals have been short, and naturally favourable to all vegetation. We are having the fat season, but the lean will surely follow...

The correspondent reported more fully on 5 May 1906:

The great volume of water being poured into Naivasha lake from the Morendat and Gilgil Rivers will probably raise the Lake this season higher than it has been since the great drought of 1898. In 1902 it was at its lowest, and merely straggling bushes of papyrus at intervals obstructed a clear view of its waters, with its thousands of waterfowl dotted over the surface. The following heavy rainfall in May, June and July of 1903 raised the water 10 or 15 chains and completely obstructed the view and approach along the lower shores to the lake, by the exuberant growth of papyrus ... Should one or two successively heavy wet seasons ensue, the assertion of one or two of the 'oldest residents', with that moral obliquity, so common in this country, more pronounced than usual, that they have seen the Lake up to the railway, may be realised. But as nature so frequently runs to extremes, we need not be surprised at a succession of dry seasons following after this heavy rainy one.

The good rains did not suit everyone and, in the issue of 10 March 1906, a farmer from Kiambu complained:

The rain coming a month too early has upset our scheme for acquiring filthy lucre and we have been busy getting in our potatoes and rescuing our beans.

On 31 March 1906, *The Times of East Africa* undertook to make information on rainfall in different parts of the country available to readers. Meantime, letters to the Lords Commissioners of His Majesty's Treasury from 1906⁸¹ indicate continuing failure of the British Treasury to finance the publication of meteorological statistics from the British Colonies, despite pleas from the Meteorological Committee of the Royal Society.⁸² Eventually, in 1910, a scheme was agreed for the exchange of data for the British Empire that would

place the various economic centres of the Empire in possession of the necessary information about the weather in the various possessions.

To fulfil this requirement, annual reports were sent from the Department of Agriculture in Nairobi to the Meteorological Office in London (copies can be found in the National

⁸⁰ Wrigley, C. C., 1965. Kenya: the patterns of economic life, 1902-1945, Chapter V in Harlow.V. and Chilver, E., *History of East Africa*, Volume II, 225, Oxford: Clarendon Press.

⁸¹ Meteorological Committee, 1906 - 1910. *Reports to the Lords Commissioners of His Majesty's Treasury, presented to both Houses of Parliament by Command of His Majesty.*

⁸² The body responsible for the British Meteorological Office at the time.

Meteorological Library at Exeter). The reports include information from the Government stock farm at Naivasha and experimental farms at Kabete, north of Nairobi and at Kibos, near to the Kavirondo (Winam) Gulf - the rainfall regime at Kibos is similar to that at Eldoret, although amounts are less. Reports indicate continuing frustration at the variability of monthly rainfall and a degree of wishful thinking that denied increasing understanding of the normal rainfall regimes.

The manager at Naivasha complained that inadequate grazing land resulted from the late arrival of the rainy season, and wrote that

... between 31st March, 1909, and 31st March, 1910, there were thirty inches of rain and more. From March 31st, 1910, to March 31st, 1911, we had on this farm only 17 inches of rain. This speaks for itself as to the dryness and drought of the past year. The rain seemed to fall in patches and hung round the hills, and it appears to be starting in the same way this year.

The lack of rain in what should by then have been recognised as a dry season brought disappointment to the experimental farms. In the report for 1910-1911, the General Manager at the Kabete complained:

Everything did very well indeed during December with but a rainfall of 1.43 over 14 days. The latter end of December was showery and then came January with only .04 ins. of rain, and very bright dry conditions prevailing every day.⁸³ This kind of weather remained until February 18th when 2.25 ins. fell, but it was exactly one month too late to save the maize crop, at least in this neighbourhood. Wheat, beans, and all other crops suffered in like manner. The maize on the farm had constant cultivation during this period of drought, and managed to retain a fairly fresh appearance and benefitted considerably by the rain. On the 7th March 1.61 ins. fell. This was accompanied by a hailstorm. ...

Again on the 10th March there fell 1.37 ins. This was excellent for some maize which was planted on fallow ground after the big rains in February, but it hampered what harvesting there was, as well as retarded preparation for land for sowing in April – the regular season. February and March have this year (1911) a rainfall of 7.82 inches spread over 18 days as contrasted with 0.15 inches in 4 days for February and March of the preceding year. Altogether there were 119 days with 0.01 inches or over from 1st April, 1910 to 31st March, 1911, giving two dry days against every single day on which rainfall could be recorded.

Rainfall was greater in total at the Kibos experimental farm than for the previous year, but was too unevenly distributed to save the staple crops of matama and maize. Low rainfall in June 1911 was also a disappointment.

Under normal conditions the flowering stage, when these crops require copious showers of rain to develop their seed, is usually reached in June. It will be seen however that only 1.97 inches was recorded in this month, and of the 6.85 inches which occurred in July, the small proportion of 1.45 inches was recorded in this month during the first twenty days, the remaining 5.40 inches being too late.⁸⁴

At Kabete, the long rains of 1911 were good, but short rains were poor. February rainfall helped to improve yields in 1912. At Kibos, rain was fairly well distributed from April to September 1912, but there were complaints that the bulk of the rain during the short rainy season occurred in one month, November, and was in consequence less

⁸³ As indicated earlier, January is generally a dry month except when ENSO conditions influence a change in the normal pattern. In some years east of the Rift Valley, there is rain in February before the beginning of the main rains in March.

⁸⁴ West of the Rift, there tends to be a break in the rains in June.

beneficial than if falls had been less in quantity but spread over a longer season at regular intervals.⁸⁵

Further contradictions are provided in the reports of rainfall for 1912-1913. At Kibos, the amount was greater than in the previous year, but its distribution less regular, whereas at Naivasha, in the Rift Valley, a better distribution of the same amount meant that sheep and lambs were not harmed by the wet as they had been in the previous year. Once again, there were problems at Kabete, where

February started with heavy rain on the 7th, and growth seemed to begin afresh. This was followed by a very wet March, when, ordinarily, we should have been harvesting, consequently crops did not ripen, maize especially, and the latter crop was all standing out at the end of our financial year, while in any previous year it would have been in the barns.⁸⁶

We find similar concerns about the distribution of rainfall in 1913-1914. At Kibos, the long rains, though adequate in quantity, were not as evenly distributed as might have been wished, but the short rains were 'a complete failure'. At Naivasha, evenly distributed rains allowed a succulent pasture throughout the year, but, at Kabete, rainfall was inadequate in both seasons and rain which came in January was 'too late to be of any value'.

Meantime, the Medical Department of the East African Protectorate,⁸⁷ having particular concern for the occurrence of malaria in both the European and indigenous populations, identified climatic zones in Kenya as Coastal, Mountainous and Desert, stressing that the whole Protectorate was situated on the Equator. Data was used for Mombasa, Nairobi and Kisumu from 1911 and included values at the Government Laboratory at Kabete farm and at Fort Hall (Muranga) from 1913.

The stimulating and exhilarating effect of the climate in the Mountainous Zone, which has been chiefly responsible for giving the Protectorate its name amongst the colonies of the Empire, is equally felt in the upland regions of the Kenia and Kavirondo [Nyanza] Provinces.

There had been a satisfactory rainfall in 1911, after 'three dry years', whereas 1912 was 'wetter than usual' and the higher rainfall values had brought about an increase in the number of cases of ill health. The report for 1913 noted that the number of cases of ill health was greatest during the cold weather in May, June, July and August.

4.4. Information for prospective settlers continues to be limited

Few descriptions of climate in the Kenya highlands available to prospective settlers kept pace with improvements in data and local experience. Somerset Playne's book on British East Africa⁸⁸ included a section on rainfall, generous statistical data and comments on experience at government farms. Regional differences in rainfall regimes were not elaborated, but chapters on the western areas painted an encouraging picture of good rains and considerable agricultural potential.

For the year ending March, 1909, the rains in the agricultural districts of the highlands were abundant in what are known as the long and short rainy seasons, with the result that there was a

⁸⁵ As already indicated, the short rains are unreliable west of the Rift compared with those to the east.

⁸⁶ A strange concern when March often marks the beginning of the long rains at Kabete.

⁸⁷ WA28.HK4.E13 (1911-18), Wellcome Library, London.

⁸⁸ Playne, Somerset, 1908-9. *East Africa (British). Its history, people, commerce, industries, and resources*, Second Impression, London: The Foreign and Colonial Compiling and Publishing Co. Somerset Playne was a Fellow of the Royal Geographical Society.

splendid harvest of all kinds of crops. The same remarks apply to the agricultural settlements in the Nairobi and the Kericho and the Kisii reserves. In fact, the plentiful supply of rain-water brought about one of the most bounteous years ever experienced in these parts of the Protectorate either by settlers or natives.

Exceptions were made for Naivasha and Uasin Gishu (Eldoret), where streams shrank to 'very small dimensions' towards the end of the dry season. A chapter by C. W. Hobley on the area from Nairobi to Fort Hall illustrates the mixture of pessimism and confidence characteristic of much that was written at the time. He deplored the cutting down of forests that had taken place as the Kikuyu expanded areas of cultivation, a procedure that was believed to have had

a bad effect on the climate and rainfall of the region, for any Kikuyu elder will point out valleys in which water perennially flowed, but which nowadays rarely contain it.

On the other hand,

an important point in favour of the Fort Hall District of British East Africa is that, owing to the regularity of the seasons, two crops of everything, except groundnuts, can be reaped.⁸⁹

Another publication recognised the relatively ample rains of the western highlands without describing the characteristically longer rainy season compared with that experienced to the east:

There are two rainy seasons, corresponding to English spring and autumn, the intervening seasons being mostly dry. Over the Nandi and Mau Plateaux, and in many parts of Kikuyu and other districts of these Highlands, whenever the land is broken up, a thick crop of indigenous clover springs up, which remains more or less green all the year round. The rainfall varies, but, generally speaking is ample.⁹⁰

In *The Climate of Africa* (1911) by A. Knox,⁹¹ however, reference is made both to Buckley's⁹² description of the March-May and October-November seasons and mist or fog on the 'Kikuyu hills' in June and July, and to Hobley's description of rainfall of the Kavirondo region (near the Winam Gulf) occurring from March to December, with a maximum in August, though we should note that there is a drier area at lake level.

Despite local experience and the better general understanding, some guidebooks continued to emphasise the rainfall regime characteristic east of the Rift Valley, illustrating how inadequate information can continue – even to the present day⁹³ – once in print.

⁸⁹ Hobley, C. W., 1908-9. Nairobi to Fort Hall. A survey of the Ukamba country. Chapter in Playne, *ibid.* Hobley went to East Africa in 1890, working initially for the British East Africa Company, but later as a colonial administrator

⁹⁰ *British East Africa. a country for the farmer and planter.* The East African Estates Ltd., 1910.

⁹¹ Knox, A., 1911. *The climate of Africa*, Cambridge University Press. H. E. Rawson reviewed the book in 1912, but, focussing on South and West Africa, paid no attention to what Knox wrote on the highlands of East Africa, Rawson, H. E., 1912. *The climate of Africa*, *Afr. Aff.* **11**: 285-289.

⁹² Buckley, R. B., 1903. Colonization and irrigation in the East Africa Protectorate, *Geogr. J.* **21**: 349-375.

⁹³ All too often, only the seasonal regime of the eastern highlands is mentioned in a summary of climate in Kenya. In 2001, Stefan Hastenrath referred to April-May and October-November rains, making no mention of the longer rainy season of the western highlands, which would have been relevant as he was considering the significance of variations in lake level for studies of climatic change. Hastenrath, S., 2001. Variations of East African climate during the past two centuries, *Climatic Change* **50**: 209-2017.

5. The First World War and its aftermath

5.1. The Department of Agriculture and meteorological data in war time

Kenya was deeply affected by the proximity of German East Africa (now Tanzania) during the First World War. Men left farms to fight and developments in European agriculture were held back. The Department of Agriculture was prohibited from publishing meteorological data during the war, but a special summary covering the years 1914 to 1919 was published in 1920. A table showing observations from 1891 omits some early observing stations, which suggests that inaccuracies had been recognised. Fort Smith, for example, is no longer included. Some stations had closed down on the outbreak of war. By 1919, however, there were 33 meteorological stations with records for at least ten years. As many as 71 new rainfall stations had been established during 1914 and 1915, making a total of 163 supplying information.

Poor rains in the Nairobi area during 1914-1915 were followed by better rains in the following year, although rain occurring from January through to June delayed the harvest of some crops by six months. The section of the report for 1916-1917 indicates an optimistic view of developments after the war:

... it is considered that a very large area of the land already alienated and of the land now surveyed and awaiting allotment is eminently suitable both for beef production and for dairying; in fact there are few parts of the Empire where climatic and pastoral conditions are so favourable for the rearing and maintenance of stock.

5.2. Available literature improves

In 1914, a *Settlers' Guide*⁹⁴ was published that warned prospective settlers to consult a friend who has already settled in one of the colonies, since, having assimilated the various booklets available, the prospective settler

will be led to ponder why there is not a general exodus from this old isle of many imperfections to these blissful lands which would appear to be free from any.

The writers were troubled by matters of health in Africa and by difficulties concerning other races, but refer favourably to the 'Highland Provinces' of British East Africa:

where conditions natural to an equatorial region are completely modified by altitude and the climate is tempered to the requirements of a European population.

After the war, the literature available to prospective settlers included more detail on local variations in climatic conditions than previously. A book by T. J. O'Shea,⁹⁵ published in 1917 and in 1920, and clearly designed to encourage settlement, refers to well-distributed rainfall throughout the year at Molo, and to heavy rains from March to September with light rains in November and early December at Rongai. According to O'Shea, East Africa was

possessed of immense agricultural resources, with soil of unsurpassed fertility, abundant water, regular rainfall, magnificent grazing and an equable climate ... a land of perpetual spring, of cool nights and bracing mornings, warm days and mild evenings ... the East

⁹⁴ G. Gordon Brown & G. N. Brown (Editors), 1914. *The Settlers' Guide. Great Britain 1914. A summary of the opportunities offered by the British Colonies to settlers of all classes*, London: Simkin, Marshall, Hamilton, Kent & Co.

⁹⁵ O'Shea, T. J. (edit.), 1917 & 1920. *Farming and planting in British East Africa*. Nairobi: Newland, Tarlton & Co.

African highlands boast of a climate which may be equalled, but cannot be surpassed. ... the rainfall abundant, regular and well distributed ... the average fall for the highlands as a whole being about 40 inches...

In some parts of the country rain is recorded in varying quantities every month of the year, but over the greater part only occasional showers fall in between seasons, bright sunny days following one another in unbroken succession, thus favouring the ripening and reaping of crops.

O'Shea's enthusiasm allowed for no disappointment. His enthusiasm was shared by Powys Cobb,⁹⁶ who wrote of the exceptional quality of the soils and climate of the highlands of Kenya.

5.3. The soldier-settlement scheme

In 1919, Brigadier-General Philip Wheatley⁹⁷ was allocated land under the Ordinance of 1915 and the Crown Lands (Discharged Soldiers Settlement) Ordinance of 1921.⁹⁸ The land was to be free to him for the first few years, but was later made over to him without charge.

Having registered his name as a soldier settler, Wheatley left Britain for Mombasa in early September 1919.⁹⁹ His land, which he named the Erith Estate, was in the District of Nanyuki, north-west of Mount Kenya, and one of his neighbours, Arnold Paice, at the Rotherwick Estate, **had been** among the earliest European settlers in Kenya.¹⁰⁰ Despite advice from Paice and information from local inhabitants, Wheatley's utter bewilderment with the weather and what to plant and when is revealed in letters to his father, who was agent to Earl Brownlow at Ashridge in Hertfordshire.

Wheatley's comments on the weather are often apt, even though mistaken. The seasonal distribution of rainfall on the northern edge of the highlands is similar on average to that of the western highlands; although there is considerable variability in distribution from year to year and values are often low (see data for Nanyuki in the Appendix). Some of Wheatley's confusion seems to have arisen from an assumption that the seasons would be similar to those experienced around Nairobi to the south, see, for example, his comment on July rainfall on 29 July (next page), when in some years he was experiencing a pattern typical of the western highlands. His confusion is evident in letters home.

On 1 May 1920, he writes:

... there has been another break in the rains and things don't look too good. There is a very considerable shortage all the way round the mountain as far as I have gone round, that is from the Amboseli River round to where I am writing now (the Outspan on

⁹⁶ E. Powys Cobb, 1923. *The Thermopylae of Africa, Kenya Colony*, Nairobi: East African Standard.

⁹⁷ Brigadier-General Philip Wheatley, C.B., C.M.G., R.S.O., 1871-1935.

⁹⁸ Morgan, W. T. W., 1963. op. cit. 3. The Soldier Settlement Scheme: Report of the Land Settlement Commission, November 21, 1918: Report of the Commission appointed to enquire into and consider the practicality of a Land Settlement Scheme for Soldiers in British East Africa, Nairobi, 1919.

⁹⁹ MSS. Afr. s. 799 (1), Philip Wheatley, His life; MSS. Afr. s. 799 (2), Letters from and to Philip Wheatley, 21.12.19 – 28.2.23, Bodleian Library of Commonwealth and African Studies at Rhodes House, Oxford, now in the Weston Library. Permission has been given by the executors of the estate of Lady Caroline Lytton to reproduce Wheatley's comments on his farm and the weather; See also Hutchinson, T. H., 2006, op. cit. 3.

¹⁰⁰ Duder, C. J. D. and Young, C. P., 1994. Paice's Place: Race and Politics in Nanyuki District, Kenya, in the 1920s, *African Affairs* 93: 253-278.

safari).¹⁰¹ One consolation is that we are no worse off than Barry, Cole, Paice or Webb because that means that we have not necessarily struck a dry belt as we had originally feared was the case. We are all equal sufferers from an abnormal year.

On 2 June:

We have not had good luck with the weather though it might have been a lot worse. After weeks of fine we are now getting showers and very cold winds ...

On 5 June, he had introduced goats:

Poor brutes have had a very bad time since I wrote last. Heavy rains and very cold winds ...

On 12 June:

Farm looks appalling. All dried up and money spent on all seeds wasted.

June shows a lull in rains even in the west.

On 18 June:

We have had two good showers of rain ... enough to freshen up the grass anyhow and to save watering the tree nursery for a week.

Days are very pleasant but a very cold southerly wind springs up every evening at 5 and continues till 10 the next day.

On 26 June:

The weather is beastly. A strong cold wind from the South blows night and day and except between say 11 and 4. I've not been properly warm for four or five days. Cloudy nearly all the time and early mornings and ensuing evenings everybody is shivering. It's playing the devil with the goats..

On 29 July:

Don't understand the weather. It has now rained every afternoon for 6 days in succession. July is supposed to be a rainless month. If this sort of thing had happened when it should have done namely in March. April and May, it would have made a big difference to us and all our crops would not have gone west. However, though too late to save them it obviates for the time being the eternal and very wearisome business of watering the tree nursery by hand.

On 21 August:

The everlasting South wind, I call it by various names during the day, is letting up a bit at last and will shortly die away altogether I fondly hope.

On 28 August:

I could have given you some of my rain today. Thunderstorms off Kenia 2 pm to 2 35 and 1.43 inches in that time. You may imagine the state of the unfortunate kitchen garden; slightly on a slope on account of the necessary irrigation. It's the first tropical storm I've seen in 10 months in the country. ... I had been putting in potatoes all the morning and many are now on the way to the Lorian Swamp, to feed the elephant there no doubt.

I don't understand the Washo. In 7 days last month we got 1½ inches and she rose 24". These storms this afternoon and the whole place was ankle deep in running water, you could only see the ground in spots, she rose exactly ½".

Another thunderstorm this afternoon. 1.12".

¹⁰¹ The Outspan Hotel, Nyeri, is close to Mount Kenya.

On 1 September:

There is a tinge of green about the country now after the two heavy showers of a few days ago.

... The series of thunderstorms round about have made the river rise 6" which does not make work easier.

... Temperatures may interest you. 8 am. Average 60° variation 57-62° Max 79° variation 73-87°. These are figures for August, the first month which I had the thermometers. The minimum thermometer has yet to come. Rainfall for the month 2.93" of which the two thunderstorms gave 2.55".

On 7 September:

The weather has certainly changed for the better and that blighting south wind has let up on us now since the first of the month.

... we hope for considerable help from the 'Short Rains' Oct and November. People say that they are a far more dependable lot than the 'Big Rains'. Anyhow as you can't have less of a thing than nothing they can't be worse [*he is worried about his fruit trees*]. You ask in your last letter whether we have struck a dry belt. No I think not. Not a permanent one anyhow. If you look at the map this is the country that the rains have failed in the year. From the Amboni River right round Kenia Mountain to 30 miles south of Meru, all North Kenia, West Kenia and the Aberdares, Rumuruti and Eastwards through Lalkipia. Nairobi, Fort Hall and Nyeri had over their average. Other parts of the Colony I can't answer for but I have heard of no complaints. Farmers in West Kenia where they have kept records for the past 10-15 years say they have never known anything like it before. The whole of the Kikuyu Reserve had ample and consequently there is a bumper crop of mealies thank goodness.

On 10 September:

As I write a thunderstorm has been going on for the past two hours and so far has given us half an inch of rain. Plain looks quite green now and grass might shortly really begin to grow.

It has been said that Wheatley was no farmer. Certainly his decision to plant fruit trees was inappropriate in an area where most were focussing on wheat and cattle. In 1924, he retired from farming to live in Nanyuki Township.¹⁰²

5.4. Was Kenya 'drying up'?

During the nineteenth century, there was increasing anxiety in southern Africa that the destruction of trees had increased the risk of drought. Such concern also prevailed in India and Australia. It became a favoured topic of intellectuals and some argued from archaeological evidence in central Asia that the deterioration of climate was 'a geological fact'.¹⁰³ Some farmers came to Kenya from South Africa bringing a drought complex with them.

In 1883, the geologist and explorer, J. W. Gregory, noted that the principal glacier on Mount Kenya was advancing,¹⁰⁴ but speculated about climatic change suggested by

¹⁰² Duder, C. J., 1993. 'Men of the Officer Class': the participants in the 1919 soldier settlement scheme in Kenya, *African Affairs* **92**: 69-87.

¹⁰³ A review of these ideas can be found in Davis, M., 2016. The coming desert: Kropotkin, Mars and the Pulse of Asia, *New Left Review* **97**: 1-14.

¹⁰⁴ Mr. Gregory's expedition to Mount Kenya (a letter received from Kinani, North-east Kikuyu, July 10th with a postscript dated August 4th), *Geogr. J.* **2**, 1893: 326-327.

moraines at some distance below the glaciers. By 1914, Hobley was writing in the *Geographical Journal* on the desiccation of East Africa¹⁰⁵ and a similar paper was published in the *Journal of the East Africa and Uganda Natural History Society* in 1916. He indicated 'a considerable desiccation of this part of the continent ... from late Tertiary times to the present day'. He drew attention to a decrease in the area under forest, particularly in the Kikuyu region, and supposed this to have been a contributory factor. Captain Henry Darley claimed that he knew the regions north of the railway 'better than anybody, black or white, as far as the Addis Ababa and Khartoum line', and that 'north of the line from Kenia to Elgon' the country was rapidly desiccating, where 'any old native will here point out places where in their boyhood they used to water their cattle'.¹⁰⁶ Although he wrote of areas north of the Kenya highlands, such arguments served only to feed anxiety that the climate might be changing.

That settlers were continually frustrated by the failure of the rainy seasons to do what they 'should', might in part be blamed on references to the rainy seasons as the 'regular rains'. Such emphasis on mean values was largely corrected in the 1950s, when statistical methods of illustrating rainfall variability were introduced.¹⁰⁷

Van Zwanberg exaggerated, when he suggested that European settlers failed to talk to local inhabitants.¹⁰⁸ Warren refers to L. S. B. Leakey's description of how the existing agricultural knowledge of the Kikuyu provided the basis on which many Kikuyu farmers rejected European farming techniques promoted by British agricultural officers.¹⁰⁹ Lord Delamere talked to the Masai¹¹⁰ and there is evidence in personal diaries and letters that Europeans, including Philip Wheatley, talked to local chiefs and others and asked them about the weather. In *The Climate of Africa* (1911), Knox quoted Ainsworth, on the dry years of 1898 and 1899, (as Eastwood had written similarly¹¹¹):

These two years seemed to complete a cycle of semi-drought, and from native information these droughts appear to occur with more or less severity every ten years.¹¹²

That many settlers failed to be comforted by such comments, assuming possible desiccation, may reflect their insecurity in a strange environment.

Conclusion

In 1926, Albert Walter was invited to take up a post as statistician to the Governors Conference in East Africa and was asked almost immediately to include the setting up of a meteorological service.¹¹³

¹⁰⁵ Hobley, C. W., 1914. The alleged desiccation of East Africa, *Geogr. J.* **44**: 467-477; Also, 1916. The alleged desiccation of East Africa, *Journal of the East Africa and Uganda Natural History Society* **5**: 4-16.

¹⁰⁶ Darley, Captain Henry, 1916. Desiccation of East Africa, *Journal of the East African Natural History Society* **5**: 99.

¹⁰⁷ By the 1950s, such concerns led to the inclusion of maps of rainfall reliability in the *East Africa Royal Commission Report 1953-5*. See Glover, J., Robinson, P. and Henderson, J. P., 1954. Provisional maps of the reliability of annual rainfall in East Africa, *Q. J. R. Met. Soc.* **80**: 602-9; Kenworthy, J. M. and Glover, J., 1958. The reliability of the main rains in Kenya, *E. Afr. Agric. J.* **23**: 267-272. These developments are summarised by Kenworthy, J. M., 1964. Rainfall and water resources in East Africa. Contrib. to Steel, R. W. and Prothero, J. M. *Geographers and the tropics*, London: Longman, Green and Co. Ltd.: 111- 137.

¹⁰⁸ op. cit. 12.

¹⁰⁹ Warren, D.M., 1992. Indigenous Knowledge, Biodiversity Conservation and Development, International Conference on Conservation of Biodiversity in Africa, Nairobi, 30 August-3 September 1992. Accessed online 03/06/2014; Leakey, Louis S. B., 1936. *Kenya: Contrasts and Problems*, London: Methuen.

¹¹⁰ op. cit. 71.

¹¹¹ op. cit. 13.

¹¹² op. cit. 91.

Some months previous to my arrival in Kenya, Mr. Holm, the Director of Agriculture in Kenya, had written to Dr Simpson, the head of the Meteorological Office in England, asking for information which would lead to the forecasting of the rain in East Africa, to which enquiry Dr. Simpson had replied that it would be necessary to organize an efficient meteorological service covering the whole of East Africa. With this stimulus and my experience and background, it was only natural that the Governors Conference Organization should ask me to inaugurate the service as an adjunct to the Statistical Service – a request with which I was only too happy to comply, in view of the reluctance with which I had given up the profession in which I had spent my whole life up to that date in Mauritius. Moreover, the prospect of carrying out research problems over an uncharted area, with all the resources of the machinery and staff of the Statistical Service at my command, was a fascinating one. I gladly agreed to accept the modest additional salary of £300 to carry out a project so dear to my heart and revert to a profession which I had relinquished with so much regret when I accepted the post in East Africa.

After inspecting stations, Walter understood the pressures experienced by the Department of Agriculture.

Reference to deficiencies and erroneous results is not intended as an adverse criticism. The defects of the service are only too well known to our able Director of Agriculture, who has shouldered the responsibility in the absence of an independent organization. A great deal could have been effected had funds been available.

He warned that

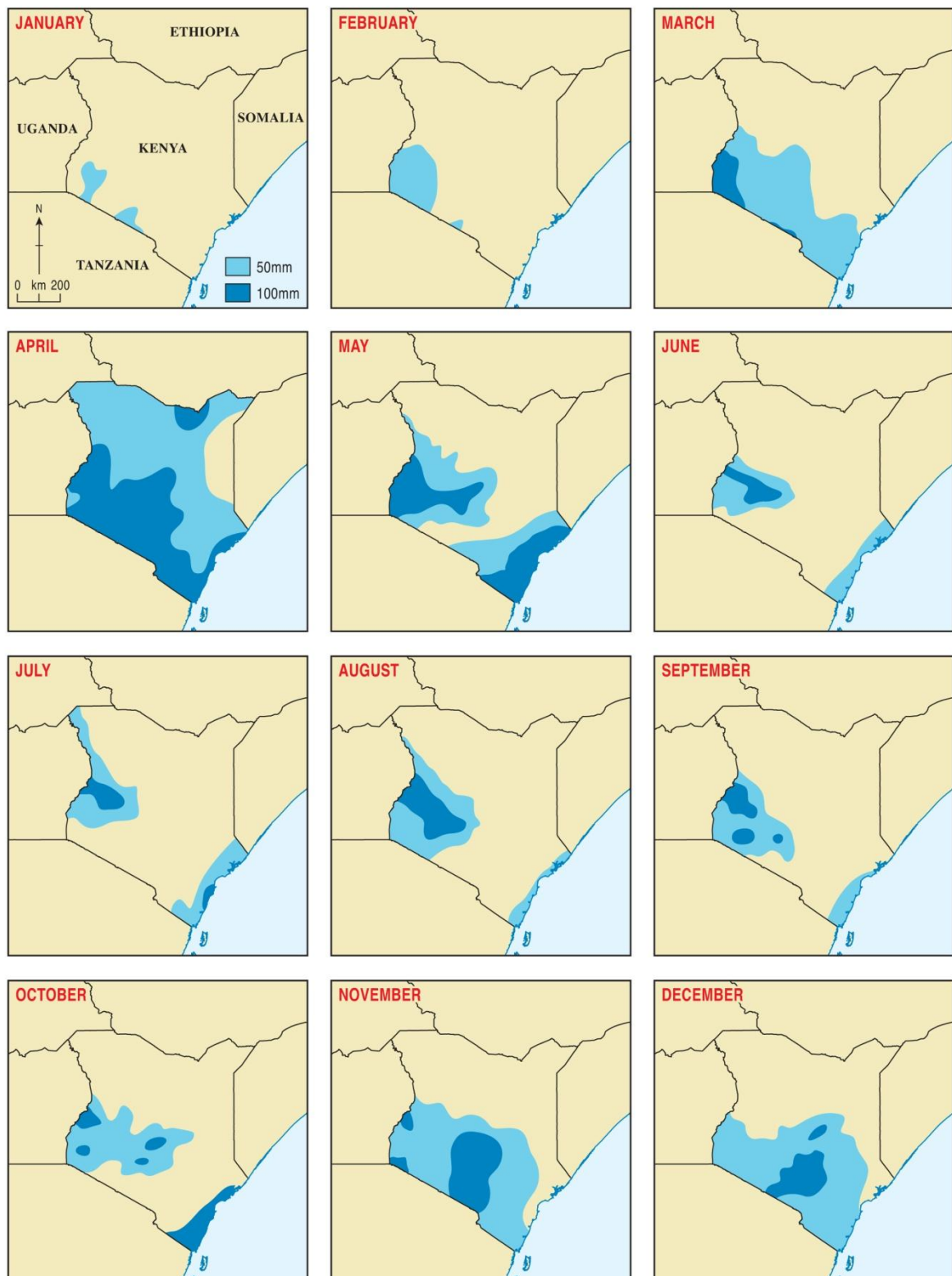
no progress can be made until gaps in our knowledge of atmospheric conditions are filled adequately. The greatest gap of all we are now endeavouring to fill: it stretches over the whole of Central Africa between 20 deg. North and 20 deg. South latitude. It is not difficult to see that the task which lies before us is not only fraught with great parochial interests, but the results to be attained are of world-wide importance in their application.¹¹⁴

Walter became first Director of a British East African Meteorological Service in 1929.

¹¹³ Kenworthy op. cit. 7.

¹¹⁴ Walter, A. 1927. Notes on meteorological research in British East Africa, *Kenya and East African Medical Journal* 4: 137-147; Kenworthy, op.cit. 7.

Appendix I

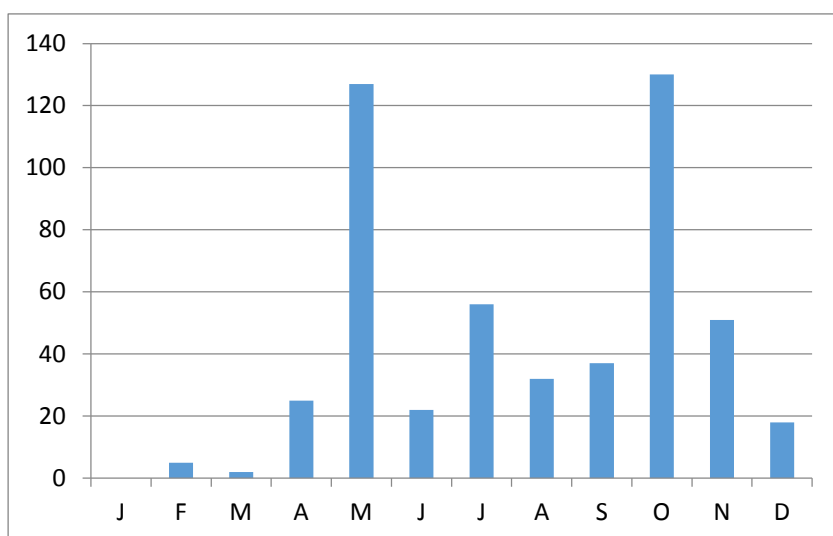


Mean monthly rainfall in Kenya showing 50mm and 100mm isohyets

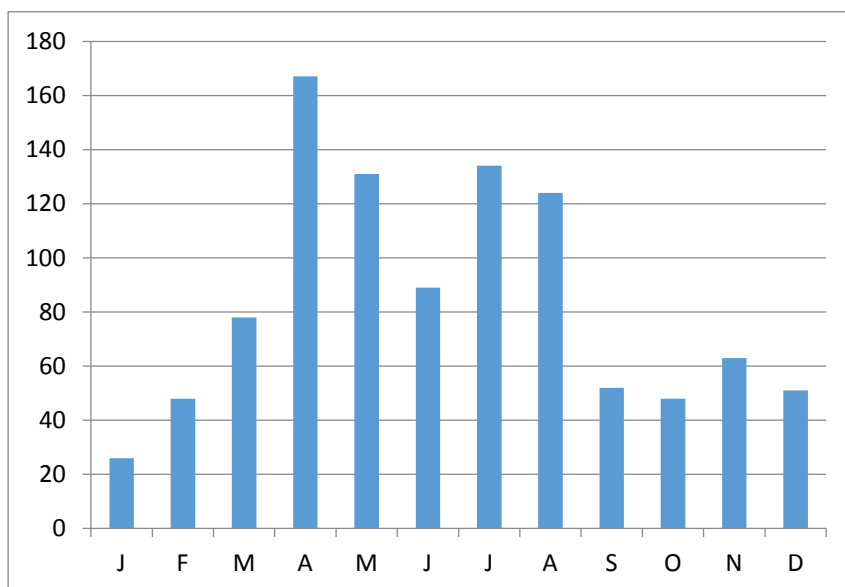
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Appendix 2 = next page

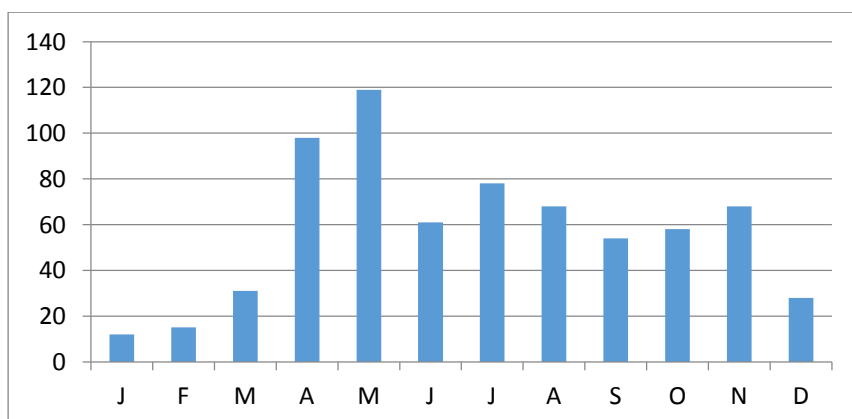
NAIROBI STATION 1° 17' S 36° 50' E 1661m



ELDORET (EUREKA ESTATE) 0° 36' 35° 26' E 2287m



NANYUKI (Sirimon) 0°05'N 37°10'E 2104m



Nairobi Station

1661m.

1° 17'S

36°

50'E

	J	F	M	A	M	J	J	A	S	O	N	D
1931	38	88	163	212	57	56	18	21	124	48	122	47
1932	70	41	241	163	107	33	17	13	13	33	90	180
1933	126	0	28	36	49	11	19	38	2	69	90	73
1934	2	45	15	79	152	25	15	7	0	47	61	45
1935	1	167	42	65	118	64	0	34	8	36	86	82
1936	63	109	93	183	32	88	4	9	10	10	60	10
1937	6	0	138	298	373	159	8	4	2	129	169	65
1938	30	102	107	80	108	6	3	5	33	40	110	156
1939	16	53	109	214	26	8	16	14	12	6	52	1
1940	43	71	152	324	208	44	24	12	8	47	67	37
1941	34	122	225	391	76	44	4	8	3	2	95	51
1942	33	33	355	218	191	49	0	26	1	15	29	118
1943	1	56	31	176	27	68	1	10	11	11	39	56
1944	8	0	140	170	23	22	19	1	72	35	143	52
1945	47	53	69	27	230	64	25	32	16	0	159	15
1946	4	6	36	168	79	5	10	47	42	170	100	41
1947	160	22	198	290	127	68	21	0	27	3	59	56
1948	1	19	113	139	50	63	9	17	35	36	104	192
1949	4	74	6	150	47	5	4	30	8	13	57	113
1950	41	14	119	182	55	20	3	41	3	163	72	5
1951	6	6	137	466	251	164	27	15	10	124	131	193
1952	2	15	15	301	162	1	20	22	16	11	85	12
1953	18	0	68	93	117	28	8	16	35	45	93	21
1954	35	37	0	241	193	51	26	5	3	10	101	20
1955	15	106	59	149	97	0	27	25	74	71	57	189
1956	147	54	112	78	46	7	13	5	13	57	153	17
1957	191	32	84	167	298	103	3	3	56	37	201	77
1958	79	287	56	138	404	51	68	0	6	10	25	100
1959	20	15	154	101	129	1	13	14	72	4	255	34
1960	97	11	230	139	76	11	5	10	17	67	93	55

Eureka
Eldoret Estate 2287m. 0°36' N 36°26' E

	J	F	M	A	M	J	J	A	S	O	N	D
1931	9	82	98	190	124	69	92	126	59	38	26	35
1932	16	102	138	121	73	29	204	71	66	43	31	33
1933	39	6	0	37	56	57	110	218	22	96	57	33
1934	0	0	27	203	114	53	161	253	4	18	53	62
1935	0	100	5	130	176	63	113	66	126	25	36	86
1936	40	332	120	287	87	200	68	116	92	50	12	19
1937	11	16	119	245	136	219	205	137	7	59	113	2
1938	96	0	68	46	99	79	131	121	26	54	35	141
1939	13	4	19	94	58	36	135	102	36	7	53	4
1940	12	203	110	201	135	54	136	55	0	11	127	4
1941	15	57	91	179	117	48	91	79	36	71	200	100
1942	6	0	156	240	172	94	78	118	21	0	7	29
1943	11	29	9	90	182	110	117	156	42	18	27	24
1944	0	7	100	133	94	42	181	140	84	47	90	52
1945	12	44	0	5	241	120	107	113	47	41	40	11
1946	2	8	39	225	115	196	129	143	0	46	28	16
1947	78	59	71	288	138	76	178	131	162	69	29	75
1948	9	8	56	152	53	62	236	78	55	153	47	16
1949	6	0	11	118	262	38	149	122	52	6	30	45
1950	22	0	93	171	41	84	161	83	23	82	8	18
1951	17	7	96	240	122	139	188	52	65	58	201	178
1952	0	38	23	222	156	28	78	92	72	29	51	9
1953	4	0	5	197	125	93	78	86	8	98	55	36
1954	11	28	18	256	161	108	179	163	103	26	42	94
1955	68	79	22	150	35	140	221	272	110	22	79	92
1956	189	26	64	188	71	58	121	132	50	43	47	
1957	31	6	72	232	241	196	92	91	15	63	108	78
1958	63	150	128	138	177	154	149	133	105	94	27	95
1959	11	52	171	118	222	16	91	126	22	37	155	14
1960	0	6	217	129	125	14	50	148	57	48	64	51

Nanyuki Sirimon 2104m 0°05' N 37° 10' E

	J	F	M	A	M	J	J	A	S	O	N	D
1931	0	5	2	25	127	22	56	32	37	130	51	18
1932	9	1	8	64	198	71	81	30	61	24	34	54
1933	39	0	0	7	45	34	43	140	90	48	126	37
1934	0	0	4	45	93	56	76	50	16	79	86	71
1935	0	24	1	31	150	175	92	79	82	51	41	11
1936	15	108	##	73	67	118	27	44	50	95	140	65
1937	17	2	44	247	81	103	59	58	23	56	64	17
1938	25	0	0	20	151	20	111	44	78	14	79	33
1939	0	6	8	95	53	55	272	77	15	61	61	5
1940	5	63	53	120	81	16	72	15	13	19	67	27
1941	0	49	58	184	112	45	47	22	70	65	71	21
1942	7	2	29	146	190	61	53	103	6	6	56	0
1943	0	6	1	54	105	70	45	58	67	29	50	46
1944	13	0	12	78	58	109	104	43	52	79	25	27
1945	0	5	0	0	162	31	99	125	105	79	67	25
1946	0	0	3	117	69	13	22	85	63	122	35	8
1947	45	12	83	125	96	54	88	70	87	37	9	39
1948	0	11	67	58	79	77	151	43	16	119	84	15
1949	0	0	0	57	108	52	49	127	45	35	47	12
1950	33	0	65	108	122	52	85	51	43	55	37	18
1951	0	0	##	190	178	22	147	59	42	74	119	64
1952	0	0	3	20	182	18	33	21	59	38	85	5
1953	1	0	34	126	200	24	45	42	28	117	89	6
1954	0	2	46	300	111	123	118	125	125	45	46	25
1959	25	34	7	100	167	55	95	134	10	39	101	19
1960	17	6	69	57	140	34	31	64	42	76	89	18

Appendix 3

Kenya Weekly News, February 14, 1969, page 6.

Rain in January

Nancy Hamill

Somebody, sooner or later, is going to blame it on those chaps, who went round the moon at Christmas. That rain, I mean. That rain that fell in January. Mucking around with the poor old moon like that, upsetting the atmosphere.

"Bad thing rain in January," the Old Folks used to say. "Bad year if it rains in January."

The farm was parched when we first saw those clouds in January this year. In spite of the heavy rain late last year, it had dried out very quickly. The grass was brown and the milk was falling off. The stream had become but a trickle and the dam had a film of green slime over it. But in spite of all that, we looked at the clouds and we wished they would go away. After all, rain in January.

The clouds became thicker and more menacing. Till then the heat had been bearable, but now, beneath that blanket of cloud, it became a sticky, steamy, exhausting heat which frayed the nerves and sapped any inclination to work. If only those clouds would go away.

"Of course," said J., looking up at them sourly, "it'll only spit. No good to anyone. Just burn the place up".

So when the spit came it shook us, for it was a helluva spit. We ourselves got 70 points. Other folks were talking about an inch and a quarter.

"Just because I'm in the middle of hay making," J. said dourly. But he perked up next morning when the day dawned bright and clear. With sun like that the hay would be dry by mid-day. Optimistically he cut more.

By teatime it was raining again, not quite so dramatically, but still nearly 40 points. And it went on like that. As rainy day followed rainy day, J. turned into an agricultural Hamlet, pacing up and down, declaiming, "To plant or not to plant, that is the question." The day we got only three points it was decided not to. This was followed, mischievously, by a whole inch in the night. Weather like this is trying on any farmer's nerves. Who could possibly come to a decision. Now if it were February it would be different. You could take a gamble with rain in February. But rain in January . . . ?

Now please don't get me wrong. I'm not grouching at the rain. I wouldn't dare – not in Kenya anyway. I've seen all too plainly what no rain means. Fields as bare as a wooden floor and just about the same colour, cattle with their ribs sticking out, famine relief. No, I'm just pointing out how it can catch you on the hop when it comes in the middle of what you are expecting to be a long and arduous dry season.

I suppose the only way to console yourself about the dry weather is to look on it as the equivalent of the English Winter, only here it is hot (much more pleasant!) instead of cold. Nothing grows. The farm looks brown and drab. There are clouds of dust and you get brassed with trying to keep the house clean, and promise yourself a major clean with the first heavy storm.

The garden looks weary and you battle valiantly to save your more delicate plants. The drinking water in the tank gets lower and you wonder if it is going to last. The heat gets you and the dryness gets you and by the time you reach March, you can appreciate why it is called the Suicide Month. Oh no, you can keep the dry weather!

This rain, however, makes you realise that it has its uses. During the preceding dry weather weeks, the labour has been digging up the weeds round the coffee trees, and leaving them where they lay for the sun to destroy. In the fields the tractors had been ploughing the soil, opening it up also to the sun's withering surgery, and the harrows were about to move in and complete the job, leaving the land ready for planting at the first downpour.

All through the past year, the D4 had been growling through the remaining acres of bush, uprooting trees and leleshwa and thorns and piling them up indiscriminately into heaps as big as a house. These had been awaiting the dry weather when they would out bonfire any bonfire anyone could possibly hope to see even on Guy Fawke's Night. On top of all that one mustn't ignore what the grassland experts say – that a 'good' dry weather does wonders for the grass.

And, of course, it's wonderful weather for making hay.

Even in and around the house I had my plans for the dry weather. There being no lawn to mow any longer, it is the ideal moment for cutting down all that bush which has been peering shaggily over the hedge at me. Once the rain has started, there is no time to do anything but weed and mow and mow and weed. So now it is manure time and preparing new beds time and chucking out the stuff you don't want time.

This year I decided it was also the time to repaint the kitchen. I was just about to enlist the cook's co-operation by suggesting that it would be very pleasant shelling peas and peeling potatoes under that nice shady tree there, and moving him bodily, plus all the kitchen furniture, when down came the rain and put paid to that one.

In fact it put paid to rather a lot. As 70 points rose to one inch and then two and finally to nearly four, the weeds between the lines of coffee sprang up and J. began to shake his head about ever getting the coffee clean. In the fields, the tractors came to a sticky stop and all the grass began to grow exuberantly again, putting the work back to Square One. When J. went to light his bonfires, there was weed rampaging between the tumbled trees and bush and everything was so green it refused to burn. And of course, we had to mow the lawn again. . . .

Hay, needless to say, became a tactless topic in our household.

And we still couldn't decide whether to plant. After all, rain in January?