

Early Maps of Ngamiland and the Okavango Delta

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Abstract

During the years 1849 to 1900 the first maps of (portions of) the Okavango Delta region in Ngamiland were produced by missionaries, explorers, travellers and adventurers. Considerable progress was made from the first attempt by Livingstone and Oswell in 1849 to the work by Passarge at the turn of the 20th century. There were great improvements in the positional accuracy of Lake Ngami, the initial attraction of the region, and many of the river courses and other features in the Okavango-Ngamiland region, as maps became much more detailed. This paper describes the progress from the first rather inaccurate mapping attempts to the more sophisticated work produced just before the turn of the 20th century when the word 'Okavango' actually began to appear on maps. These early mapping efforts laid the foundation for the cartography of the colonial era.

Early Maps of Ngamiland and the Okavango Delta

Introduction

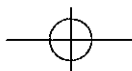
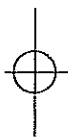
Hunters, traders, missionaries as well as explorers and other adventurers travelled into the uncharted interior of southern Africa from the early 1800s or before (Wilmsen, 1982). Hunters for ivory, skins and other trophies and, possibly, slaves, were probably first, although relatively few left geographic records of their travels (Stone, 1995). Traders too penetrated the far interior of the sub-continent, but, again, left few written records of their exploits. Those who did - together with missionaries and explorers, who were usually more inclined to communicate their experiences to the rest of the world - left for us the first maps and geographical descriptions of the Ngamiland and Okavango regions of central southern Africa.

Maps with their embedded travel information served as indispensable tools for hunters and traders opening up new trading routes, for prospectors in search of minerals, and for missionaries attempting to reach unconverted tribes where new mission stations could be established. Explorers were often keen to generate scientific data in map form (Stone, 1995). Maps also served the purpose of colonial conquest and administration.

In the decades leading up to the year 1900, regions in central southern Africa that were previously cartographically 'non-existent' were 'put on the map'. Through the cumulative efforts of these pioneers, increasingly better maps were produced of the Ngamiland and Okavango regions that laid the foundation for the maps we use today. This paper describes the progress from the first rather inaccurate mapping attempts to the more sophisticated work produced just before the turn of the 20th century, when the word 'Okavango' actually began to appear on maps.

The first Okavango Maps were Lake Ngami Maps

The reverend John Campbell travelled to what is now Botswana around 1835 but did not visit the Okavango Delta (Campbell, 1874). Portuguese (slave-) traders or their representatives were known to operate in the Linyanti and Upper Okavango regions, and Portuguese maps were in existence possibly around 1850 (Schultz and Hammar, 1897). There are no records of the



Portuguese visiting the lower reaches of the Okavango River or the Lake Ngami area, although Portuguese goods such as muzzle loading guns and beads reached Ngamiland from trading posts along the Angolan coast (Tlou, 1985).

The first written record of a visit to the Okavango-Ngamiland region by an outsider, which resulted in a map, is therefore that of 1849 by Livingstone, Oswell and Murray (Livingstone, 1857; Oswell, 1900). They did not penetrate the Okavango Delta proper but visited and 'discovered', for the western world, Lake Ngami and the Thamalakane River. They found this region inhabited mostly by WaYeyei people with the BaTawana settled at Toteng (Livingstone, 1857). Livingstone was then still mostly a missionary but already had ambitions to be an important explorer. He therefore made sure to be the first in his party, consisting also of Oswell and Murray - gentlemen of means and sponsors of the expedition - to see Lake Ngami (Wagner Parsons, 1997), and he made copious notes and a multitude of scientific observations. Map-making was one of the required skills of an explorer, and with the available instruments of the time he did a remarkable job of recording coordinates, locations and routes in the regions he travelled through. Many of his notes are relevant to his work as missionary and explorer, but he also recorded observations on a variety of other topics including ethnography, flora and fauna. Many observations also dwelled on the details of daily travel, concentrating on water points and grazing for draught animals as well as tsetse fly and malaria conditions. This was very important information for later travellers.

Making maps was not easy under the circumstances of 1849, as shown by the following quote from Livingstone's *Missionary Travels*: "Two enormous baobabs grow near its (*i.e. the Nhabe River*) confluence with the lake where we took the observations for latitude ($20^{\circ} 20' S.$). We were unable to ascertain the longitude of the lake, as our watches were useless; it may be between 22° and $23^{\circ} E.$ " (Livingstone, 1857, p. 70). Interestingly, but perhaps because of such problems (and possibly, also due to his disappointment with the prospect of developing shipping routes in the Lake Ngami region after observing the shallowness of the Lake and its outlet), Lake Ngami does not feature on the detailed map in *Missionary Travels* that is included in the cover of the book. That map shows only the northern areas of Livingstone's travels. Lake Ngami is, however, shown on the much smaller overview map, at a scale of 1 inch to 300 miles (Figure 1), included in the main body of the book (Livingstone, 1857). His partner in the discovery of Lake Ngami, Oswell, does show the Lake area on his map, but not being as scientifically inclined, his map is more a sketch map than a cartographic document (Figure 2). Even Livingstone's more sophisticated cartographic drawing, professionally executed by John Arrowsmith in London, appears rather rudimentary to current observers. Mostly, the accuracy of longitude is lacking due to problems of inaccurate watches and Livingstone actually losing the use of his watches entirely on this first journey. Although relatively good clocks, watches and chronometers existed, they were often not up to the rigours (temperature, humidity, dust, shaky wagons) of African bush life, and they were not extremely accurate even when they worked, erring by seconds or minutes per day.

Navigators could measure the local time, wherever they were, by observing the sun, but proper navigation required that they also knew the time at some reference point, e.g. Greenwich, in order to calculate their longitude. Longitude could be determined only in two ways. One way was by using two good clocks (or chronometers) and comparing local time, determined by observation of the sun, with the time on a second clock that was kept at Greenwich time. (The Greenwich meridian was not accepted internationally until 1884, but was used by the British from the 18th century.) The other way was to determine positions of stars and moon at known local time and use almanacs to calculate the longitude. With an accurate catalogue of the

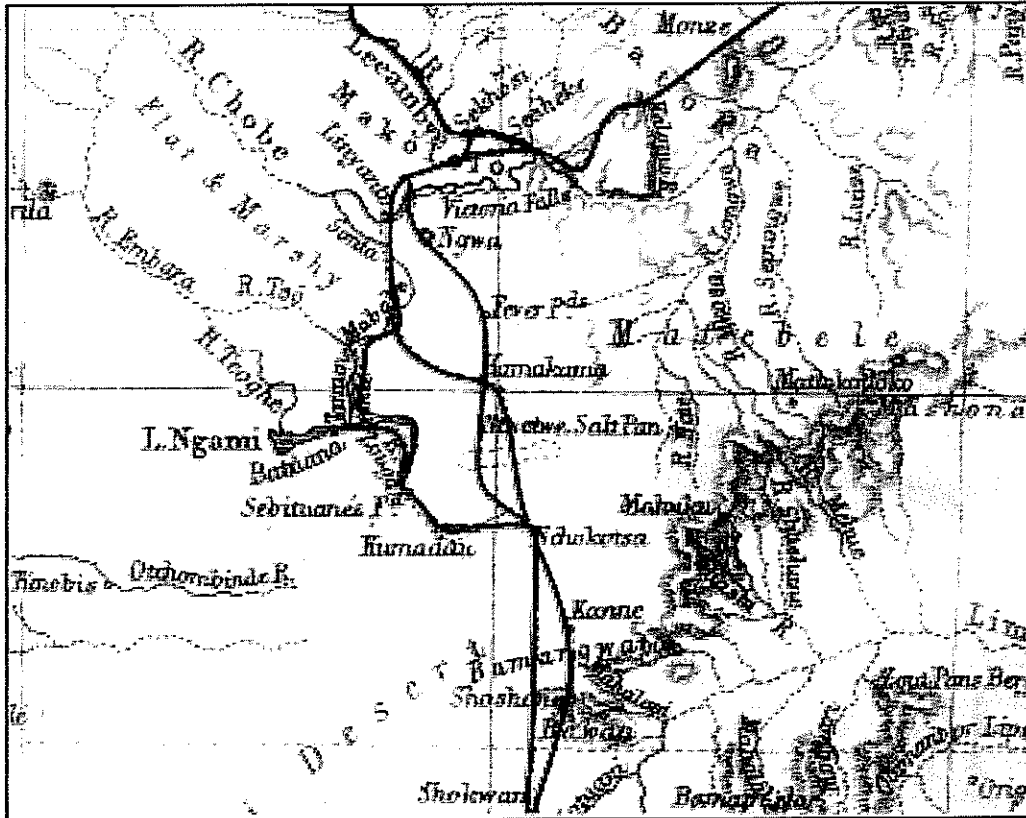
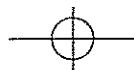


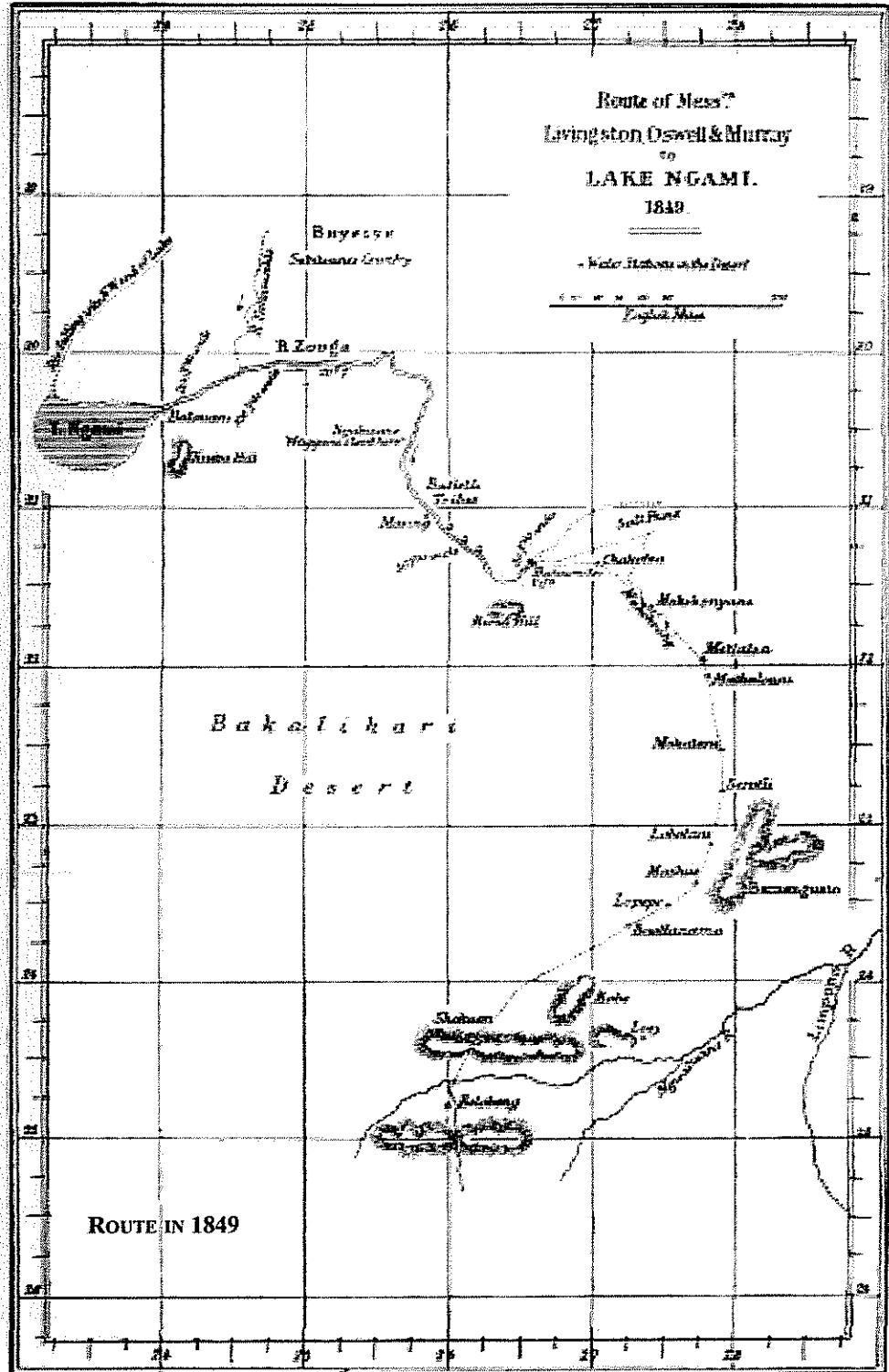
Figure 1. Portion of the overview map in Livingstone's *Missionary Travels* (source: adapted from: Livingstone, 1857). Curiously, Lake Ngami is not included on the more detailed map inserted in the backcover. The latter map shows only the region north of Lake Ngami.

positions of the stars, and the position of the moon then measured precisely relative to the stars, the moon's motion could be used as a natural clock to calculate Greenwich time. Navigators could measure the moon's position relative to bright stars and use tables of the moon's position, compiled by the Royal Observatory, to calculate the time at Greenwich. This required only one clock to know the local time of lunar observation. This means of finding Longitude was known as the 'Lunar Distance Method'.

The version of the map presented by Oswell (Figure 2) is rather vague and like Livingstone's shows not much of the, then largely unknown, Okavango Delta, which, despite reports from the local inhabitants about this "country full of rivers" (Livingstone, 1857, p. 65), did not attract the attention of the explorer and missionary. Instead, the map shows the travel route from Kolobeng in the south to the Zouga (i.e. Boteti) River and further to Lake Ngami, marking many of the important 'water stations'. Note that Lake Ngami is situated close to longitude 24 East, a full degree (i.e. over 100 km) east of its correct location, in spite of the earlier conclusion by Livingstone, possibly unknown to Oswell, that the Lake was situated between 22 and 23 degrees East.

Figure 2. Oswell's sketch map: note the (wrong) longitude of Lake Ngami (Source: Oswell, 1890). →





The 'discovery' of Lake Ngami resulted in a visitor's rush to Ngamiland, with 50 official foreign white visitors recorded in the 11 years following Livingstone's visit (Potten, 1975). Most were hunters and traders (69%) but there were also missionaries, naturalists, settlers, engineers, photographers, tourists and honeymooners (Potten, 1975). It became popular to write books about adventures, travels and discoveries in the region. Titles such as *Travels in the interior of South Africa* (Chapman, 1868), *African Hunting and Adventure* (Baldwin, 1967), *Ten years north of the Orange River from 1859 to 1869* (Mackenzie, 1971) or *Eleven years in Central South Africa* (Thomas, 1970) appealed to the public. Many of these books followed the pattern of *Missionary Travels* with their illustrations and maps, but few if any matched the scientific depth and scope of Livingstone's observations. Many of the maps were simply copies of those of Livingstone and Oswell with a few additional details scribbled on.

Exploration became a lucrative enterprise for those inclined to trade or an exciting pastime for men of leisure and means. In 1855 therefore a book was published by Francis Galton on *The Art of Travelling, Shifts and Contrivances available in wild countries*, followed by a more extensive book by Lord and Baines entitled *Shifts and Expedients of camp life, travel and exploration* in 1871. This latter book is interesting because it includes advice on the scientific instruments needed for exploration and map-making and gives practical instructions in the use of the various instruments. A sketch is presented of a portable observatory, designed by Baines, that included the most needed instrumentation: artificial horizon, pocket sextant, prismatic compass, a note book and tables of declination (Figure 3). With sextant and artificial horizon, latitude could be determined to within a mile. For the more difficult measurement of longitude a good clock was necessary. Lord and Baines recommend 'a good well-going hunting watch to be used 'in the observation of lunar distances' rather than 'for an explorer to trouble himself with a chronometer' (Lord and Baines, 1975, p. 25). The early chronometers weighed over 20 kilograms, while the more manageable later models (such as the Harrison 4) were difficult to obtain and very expensive. The inaccuracy of these instruments, although relatively small in the later models, made them less useful during journeys spanning several months.

The next explorer of some interest to come along and map the Ngami/Okavango region

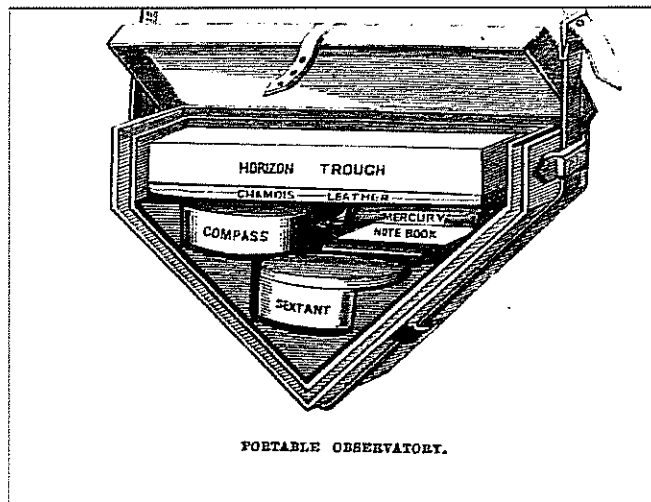


Figure 3. Portable observatory for explorers designed by Baines (source: Lord and Baines, 1975, p. 25).

was the young (24 at the start of his explorations) Andersson, a British/Swedish adventurer, trader and explorer. After a failed first trip, he reached Lake Ngami on his second attempt and was the first explorer to travel up the Taoghe River, then feeding Lake Ngami. The map he produced at a scale 1:3 785 000 or 52 miles to 1 inch (Figure 4) is of interest because he was the first to map the route to Ngamiland from the Namibian coast and the first explorer to map a major section of the course of the Taoghe River, then a strongly flowing river outlet from the Okavango that fed Lake Ngami. Also to Andersson, longitude remained most difficult to measure as it could be achieved only with accurate clocks. Both Livingstone and Baines lost the use of their clocks at some point during their journey and this made the recording of longitudes very difficult, having to depend on compass bearings and the recording of distances travelled, a major challenge in the sandy terrain of the Kalahari. Andersson does not mention much about his mapping efforts. On his map the 23rd meridian runs right down the middle of Lake Ngami, giving an error of at least 20 km in the longitude dimension, corresponding to a clock error of about 3 minutes.

Andersson wrote an elaborate monograph about his travels in the Okavango area, and describes in detail his journey up the Taoghe River. He also describes some aspects of the natural environment, including tsetse fly conditions, but concentrates heavily on the description of wildlife because of his interest in hunting and collecting specimens. He was particularly interested in elephant and rhinoceros:

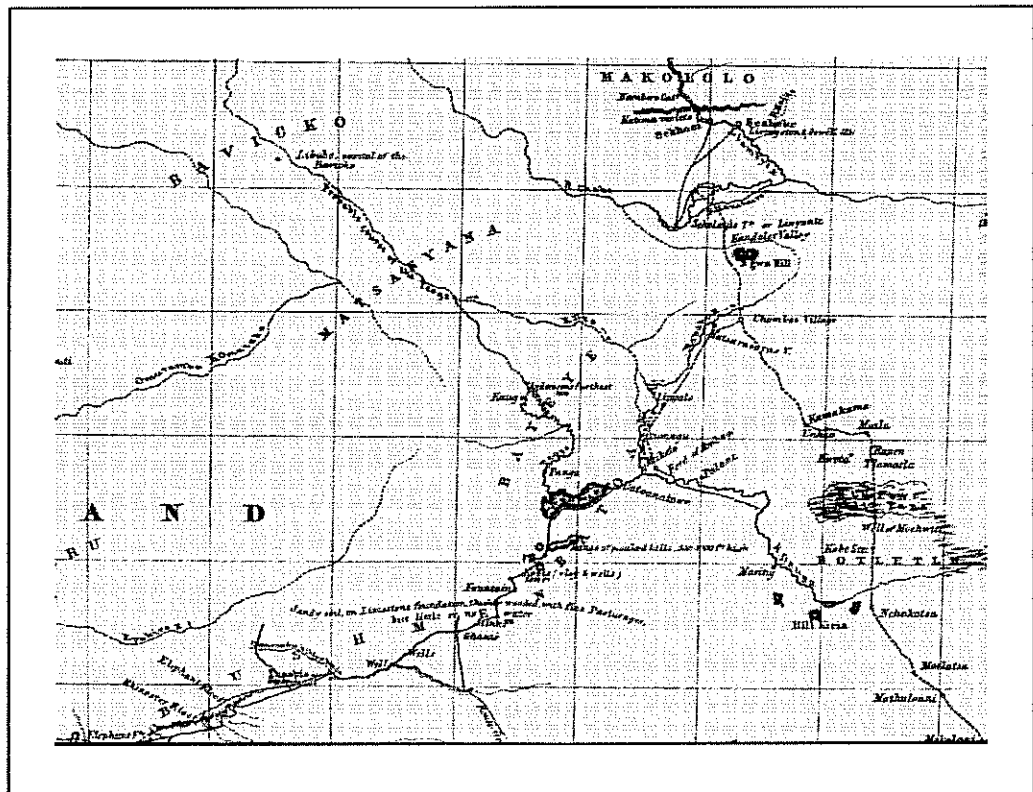


Figure 4. Portion of Andersson's map with accurate alignment of (part of) the Taoghe (source: adapted from: Andersson, 1856).

"The number of rhinoceroses destroyed annually in south Africa is very considerable. Of this, some idea may be formed, when I mention that Messrs. Oswell and Vardon killed, in one year, no less than eighty-nine of these animals; in my present journey, I, myself, shot, single-handed, nearly two-thirds of this amount." (Andersson, 1856, p. 401).

The next explorer of some fame to pass through Ngamiland was Baines, most famous for his paintings, although he was also an accomplished writer and map maker. As already mentioned, he designed a portable observatory (Figure 3) and co-authored a book for travellers. Through elaborate observations, he managed to correct many of the details of the earlier map of Livingstone, especially in the Lake Ngami and Boteti regions. Baines makes ample references to his surveying work:

"In the evening I took the angular distance between the moon and Venus, and Chapman afterwards observed the altitude of Aldebaran, which gave latitude $20^{\circ} 36' 38''$ " (Baines 1973, p. 264). This occurred on Monday 9th December 1861 at the edge of Lake Ngami."

His map, at 1 inch to 50 miles, in addition to being artistically appealing, also contains more detail than any other contemporary map and is much more correct in terms of, for instance, the

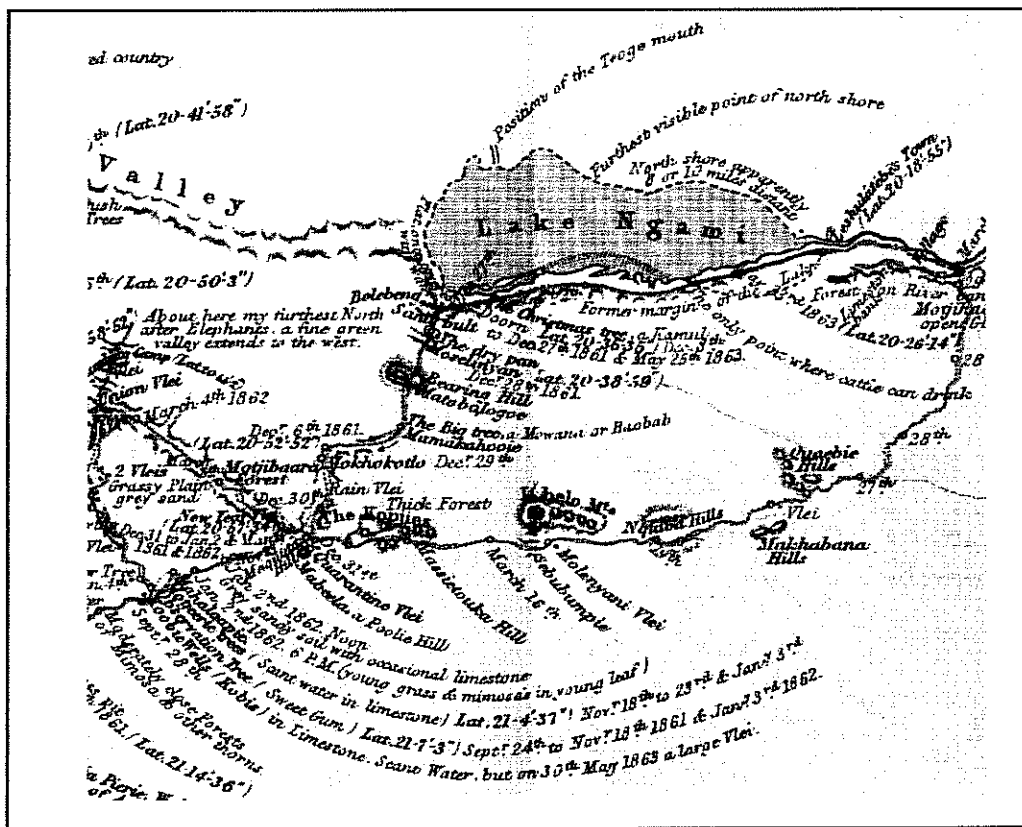


Figure 5. Portion of Baines's map, showing the many details of the Lake Ngami area (source: adapted from: Baines, 1973).

shape of Lake Ngami and the course of the Nhabe, Thamalakane and Boteti Rivers than earlier efforts (Figure 5). As would be expected his map is marked with 'Baobab' at the approximate location of the site currently known as 'Baines' Baobabs'.

Baines made numerous sketches and drawings and a great number of observations on a wide range of topics, and included many details in his maps, which are liberally annotated with scribbled comments without becoming cluttered. Being an amazingly energetic person, he spared no effort to make the best possible observations by climbing trees (another Baobab tree, a preferred look-out point, is marked on his map as 'The outpost of the Desert') and hilltops such as at Quacbie (Kgwebe) Hills:

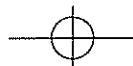
"And after climbing masses of black igneous rock, more or less hidden by long dry grass, we saw in the far distance the waters of Lake Ngami, stretching from north to north-west by west, and could plainly distinguish the shore on the opposite side, as well as the smoke from the heaps of reeds and bulrushes, burned by the natives about this season." (Baines, 1873, p. 407). Baines did not, however, venture into the Okavango unlike Andersson, but followed Livingstone's earlier route to the Victoria Falls.

Many of the early European explorers, following Livingstone's lead, were obsessed with Lake Ngami and its assumed vast resource of fresh water in an otherwise arid wasteland, and with the idea of using its waterways for navigation to access remote areas for missionary work, trade and for combating slavery. Curiously, most were not interested in the Okavango. This name does not even appear on any of the early maps. Nor was interest shown in the source of the waters, although the Taoghe and Thamalakane Rivers feature on some maps. Those who came after Livingstone, who found the Lake as a vast stretch of water but otherwise not very interesting to the point that it is not even shown on his detailed map in *Missionary Travels*, discovered that the Lake was not as permanent as it had seemed at first. Andersson is somewhat disappointed: "The Lake was now very low; and at the point first seen by us, exceedingly shallow" (Andersson, 1856, p. 433), and Baines also found it much reduced "with the reeds marking the former extent of the waters, which had now receded" (Baines, 1873, p. 262). By 1896, Passarge found it completely dried up (Passarge, 1905).

Maps of the Okavango beyond Lake Ngami

Subsequently the attention of the explorers/adventurers turned more toward the Okavango, the source of the water that was feeding Lake Ngami and the Boteti and other rivers in the region. As before, hunters and traders preceded those who left written records. Andersson, although he does not mention the name Okavango, was the first explorer to leave a map record of his journey into the Okavango region up the Taoghe River channel, by him (correctly) believed to be connected to a major river originating further northwest (Figure 4).

Special mention needs to be made of the mapping efforts of Schultz and Hammar, who in 1884 set out "with the object of completing the survey of the Chobe river to its sources, and generally of investigating this unknown portion of Central South Africa" (Schultz and Hammar, 1897, p. 1). In the process they travelled up the Linyanti River and cut across to the Okavango River (given as 'Okovanga') above the Popa Falls, then down the river to Lake Ngami, completing the detailed mapping of the course of the Okavango-Taoghe Rivers from the Popa Falls in Namibia into Botswana. They also made inferences about the course of several other Okavango channels, including the Thamalakane and the Selinda spillway, thereby demonstrating the connection between the Okavango and the Chobe as shown in their very



detailed map, produced at a scale of 1: 2 000 000 (or 31.5 miles to 1 inch) by Bartholomew in Edinburgh (Figure 6). The accuracy of their mapping was enhanced because they owned a very good naval chronometer, still in working condition today, in Sweden.

At the end of the 19th century, the thorough and meticulous German geographer and ethnographer, Passarge, came on an expedition to the area. His map adds much more overall detail to the river systems of the Okavango, showing several channels and, for the first time, the

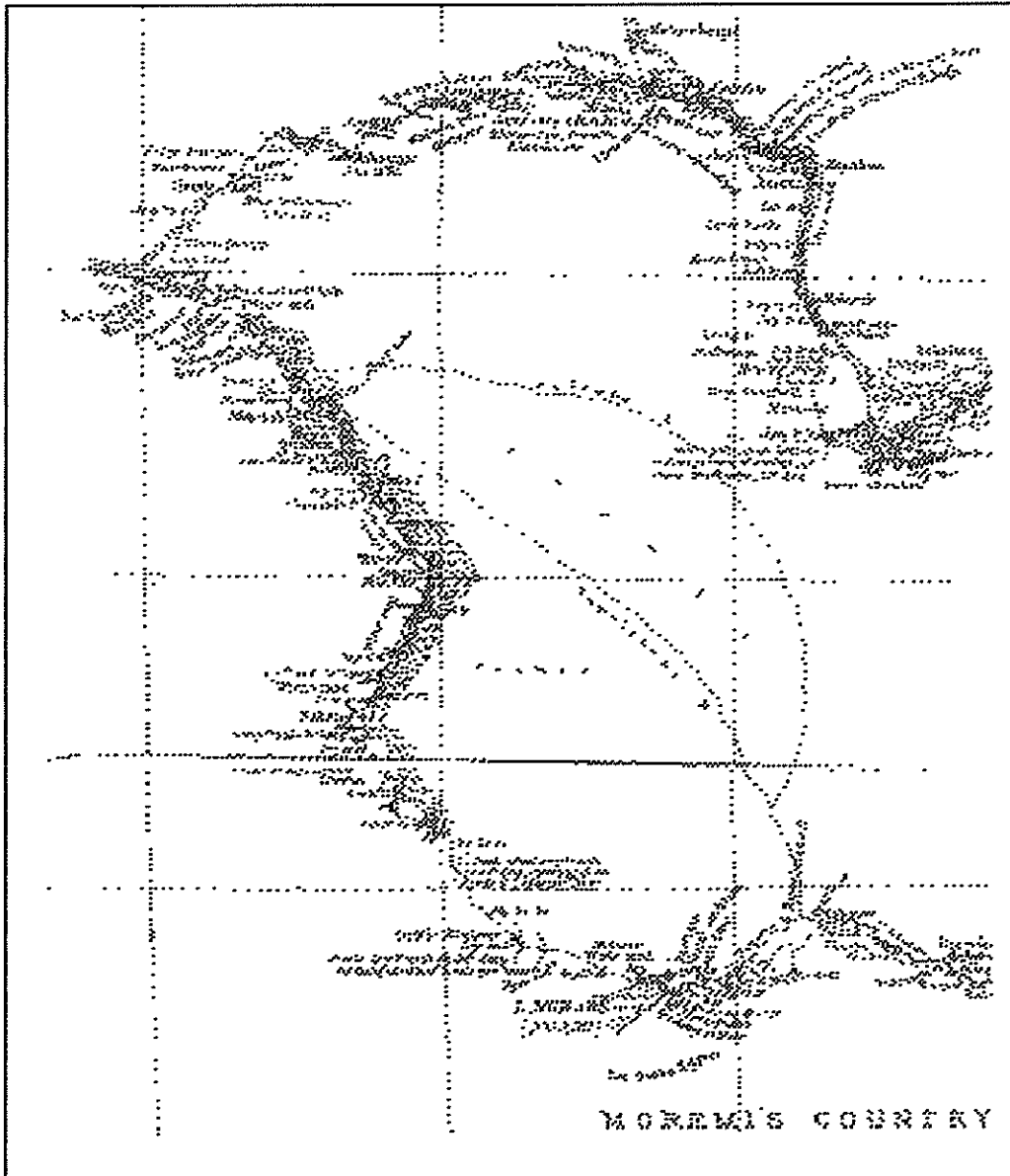


Figure 6. The map of Schultz and Hammarwith details of the upper Okavango and Selinda spillway (source: adapted from: Schultz and Hammar, 1897).

vague shape of a Delta. He was also the first known foreign visitor to the Tsodilo Hills (marked as Tschorillo on his map (Figure 7)). Moreover, Passarge provides elaborate descriptions of his travels across western and southern Ngamiland, giving a first account of the human geography and the ethnography of the region. Passarge also describes the drying up of Lake Ngami and the blocking of the Taoghe channel. In 1896, he writes "These days, the channels of the river that used to flow into the Ngami are dried up. The river itself dried up about 20 miles north of the lake." "The Taoghe reached the lake for the last time about 10 years ago. In the year 1896 it had already disappeared, and now footpaths cross it at several points." (Wilmsen 1997, p. 49).

As a geographer, Passarge, who wrote all his reports and books in German, observed the "evolution of the countryside" as a result of the drying up of Lake Ngami, seeing this event as an example of the wider process of "how the Kalahari evolved". In the Ngami area he noted that "The reed dried, the ground dried out, the cultivation of grain, which in earlier years had taken place to a large extent in the burned reeds, became impossible. The numerous villages became deserted, and now the shores of the lake are almost uninhabited. Cultivation no longer exists at the river, only a few kraals are to be found nearby." (Wilmsen 1997, p. 50).

From the manner of his writings, Passarge comes across as a rather precise observer and a solid scientist; not an adventurer like Andersson. He spent several years in the Okavango and Kalahari regions and was not just passing through, like others, en route to more rewarding or

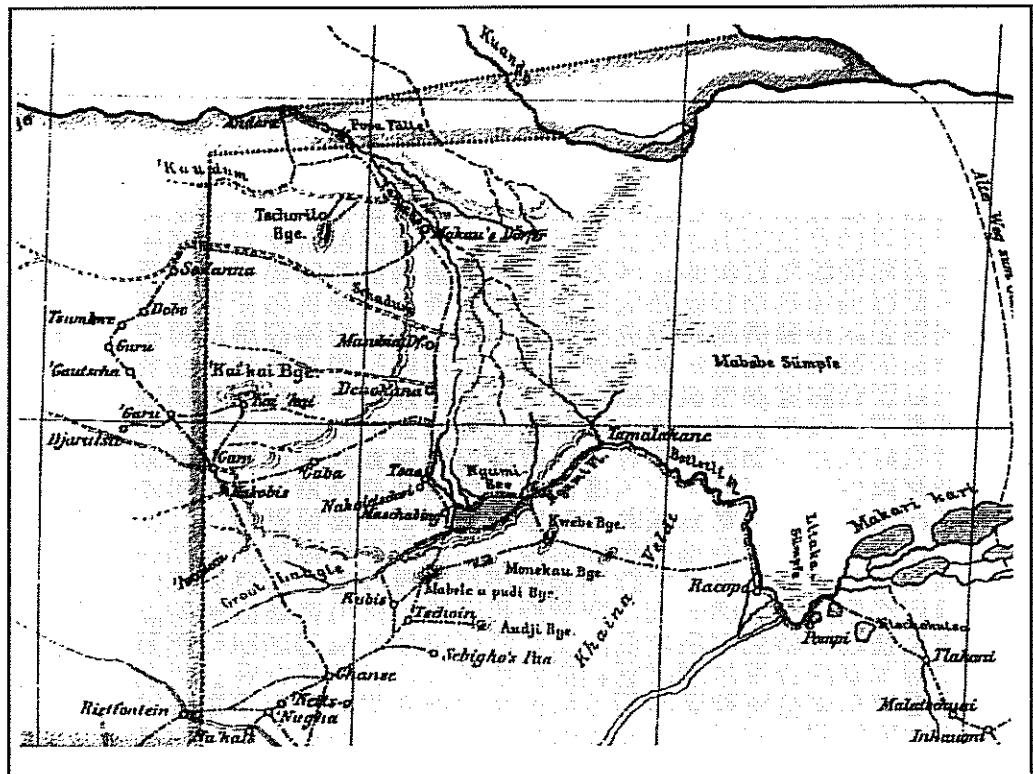


Figure 7. Portion of the map of Passarge showing considerable detail of the Okavango. Note that Lake Ngami and Tsodilo Hills are more or less in the correct locations (source: adapted from: Wilmsen, 1997).

more spectacular destinations. His ethnographic observations, especially, are still highly relevant today (Wilmsen, 1997).

Unfortunately, not many of these detailed observations are reflected in his map. While Passarge's map is more geographically correct than all previous maps, with the possible exception of the one produced by Schultz and Hammar, it is unfortunately produced only at a scale of 1: 4 000 000 and lacks the detail and depth of comment found on the maps produced by Baines or Schultz and Hammar. Nevertheless, Passarge's map portrays Lake Ngami in more or less the correct position and shows the outline of what to current observers may appear to be the Okavango Delta as we know it. This map, the last represented in this paper, may be regarded as the culmination of the pre-colonial mapping efforts of traders, hunters, explorers and missionaries. It symbolizes also the end of that free-for-all pre-1900 era, and marks the beginning of modern professional map-making of the colonial period.

In 1894 the Ngamiland region was incorporated into the British Bechuanaland Protectorate. This implied that from then on mapping and 'discovering' became 'official business'. It nevertheless took a while before Stigand started his elaborate mapping work by compass traverse in and around the Delta, producing maps that may be regarded as the next generation compared to the maps produced during the Livingstone-Passarge era. Stigand worked as Resident Magistrate but went far beyond the call of duty to explore and map the Okavango Delta and the wider Ngamiland and Ghanzi regions, no doubt mostly because of his personal enchantment with the natural world and the people of the region. His map belongs to a new era of professionalism and became a leading example of mapping in the entire Bechuanaland region (Stone, 1995). He published his map in *The Geographical Journal* of December 1923 in the context of a paper that in his own words was subsidiary to the map itself: "This paper has been written as an adjunct to the writer's sketch-map – the result of numerous journeys by land and water in Ngamiland during the last thirteen years – rather than the map being supplementary to the paper." (Stigand, 1923, p. 401). Stone (1995) records that the culmination of Stigand's work was the official publication in 1925 of his two-sheet map at a scale of 1:500 000. These became the official maps of the region until the post World-War-2 era.

Conclusion

During the second half of the 19th century the first maps of the Ngamiland and Okavango regions in central southern Africa were produced by missionaries, explorers, travellers and adventurers. Considerable progress was made from the earliest attempts by Livingstone and Oswell to the work by Passarge at the turn of the century. There were great improvements in the positional accuracy of Lake Ngami and many of the river courses in Ngamiland, while maps became increasingly more detailed. Through the cumulative efforts of the early pioneers of mapping, increasingly better maps were produced of the Okavango region that laid the foundation for the cartography of the colonial era as taken up by Stigand in Ngamiland.

Acknowledgements

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