



Notes on the Geography of South Central Africa, in Explanation of a New Map of the Region

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*Notes on the Geography of South Central Africa, in explanation of
a New Map of the Region.*

By ANDREW A. ANDERSON, Civil Engineer.

Map, p. 56.*

THE map which I have the honour to submit to the Society comprises the whole of South Africa north of the Orange and Vaal rivers to the Zambesi, and from the South Atlantic to the Indian Ocean (with the exception of some portion of the Transvaal, part of the east coast, and the country on the Lower Zambesi); a region which has been explored and mapped from my own surveys extending over a period of sixteen years, from 1864.

I commenced my explorations early in that year, north of the Upper Vaal river, originally for scientific purposes, in connection with geology, botany, ethnology, and such other objects of interest as might come under my observation more particularly relating to the native races inhabiting this extensive and almost unknown region. Not being able to procure any map of the country I intended visiting, the greater part never having been explored, I determined at once to commence a regular survey north of these two rivers, to penetrate the interior to the Zambesi, and take in the whole of this part of the African continent from sea to sea as circumstances and opportunities occurred. I provided myself with the necessary instruments for taking observations, in addition to those I already possessed, including in all, a common theodolite, prismatic compass, two aneroid barometers, an ordinary compass, a 6-inch sextant, pocket sextant, boiling-point apparatus, a trocheameter, and three thermometers. I proceeded in June 1864 to the source of the Vaal river, intending to divide the country into sections, but had to alter my plans in this respect, as the Boers of the Transvaal were strongly opposed to any survey being made of their country by an Englishman; I had therefore to use great caution and keep my work secret, not only from them, but also from the Kaffirs, and events afterwards proved the prudence of this resolution. Having plenty of time at my disposal, I was able to pursue my work systematically and carefully in connection with my other pursuits.

To describe each of the journeys I undertook would extend this paper to an unusual length; I judge it better, therefore, to give a general geographical outline of the various regions explored, such as will, I trust, sufficiently explain the topography of the extensive and interesting portion of Africa, at present so little known, which my map embraces.

* We limit ourselves to reproducing Mr. Anderson's map, which, it will be observed, leaves blank all parts which he did not himself explore, and have slightly reduced the scale of his original drawing, viz. from 40 miles to the inch to 57½ miles.—Ed.

The upper source of the Vaal was my first field of operations, taking in the numerous small branches which spring from the Quathlamba Mountains, in the eastern division of the Transvaal, now called New Scotland and Wakkerstroom district, and from Klip Staple, an isolated hill 6110 feet in altitude above sea-level, also from Lake Cressie at an elevation of 5813 feet. Ransberg, a part of the Quathlamba, at this point is 6800 feet, and in lat. S. $26^{\circ} 10'$, E. long. $30^{\circ} 32'$. From the source of this river, I followed its course westward. Being an important stream draining an extensive surface, I wished to make it the base of my operations, and proceeded as far as Potchefstroom, the capital of the Transvaal. Continuing west, I traced the river down to where Bloemhof now stands, taking in the country on the north up to the Vlei, the source of the Harts river, where Lichtenburg now stands, and completed the survey of that and the Vaal river, and the country between.

FROM THE VAAL TO THE GREAT FISH RIVER.

At this time, in 1865, I had to suspend my labours in this direction, the unsettled state of the country, the jealousy of the Boers, and the encroachments they were making on native lands, compelling me to turn my attention northwards, and after travelling twelve days over extensive grass plains which literally swarmed with game, I arrived at the eye of the Molapo river. Thinking myself secure from interruption, I explored the whole of that district, then commenced upon the river Molapo, which I found was the limit of the south-east corner of the Kalahara Desert, following its course westward, through an open country, uninhabited, in consequence of the scarcity of water, for eight months of the year, except in places in its bed, where water is obtained by digging.

I arrived at the great bend which the Molapo takes, in S. lat. $25^{\circ} 50'$, E. long. $21^{\circ} 16'$. At this point the name Molapo ceases, and the river runs due south and enters the Orange River at Kakamans Drift, under the name Hygap. The source of the Molapo is on the west slope of the great watershed, at an altitude of 5350 feet, in S. lat. $26^{\circ} 15'$, E. long. $25^{\circ} 55'$, where a plentiful supply of pure water flows throughout the year. It is the most important river entering the Orange below the Vaal on the north, in consequence of the many tributaries that drain the central and south Kalahara Desert, viz. the Nosop, Oup, and the Back rivers. In all these streams, whatever may be the quantity of water that may flow from the springs at their source, it is soon lost in the sand of their beds, from which it can be obtained by digging. From Kakamans Drift on the Orange, I completed the survey to the Harts river, and the country between that river and the Molapo. The Vaal enters the Orange about 50 miles below Hope Town; there the Orange takes a westerly course and falls into the South Atlantic.

From Potchefstroom in the Transvaal, which town is situated on the

Moi river about 20 miles north of the Vaal, in S. lat. $26^{\circ} 40'$, E. long. $27^{\circ} 34'$, to the west, between the Harts and that river, the country is entirely occupied by farms belonging to English and Dutch farmers. It is undulating, with rich open grass plains, and many salt and beach pans, where good salt is procured. Most of these pans are large, some six and seven miles round, others about two, and at some remote period they appear to have been always full of water to the depth of over 100 feet, but now never more than two feet is ever found in them: the formation is always limestone. There are several small sprouts or streams that drain this district and enter the Vaal; some of the principal are Scoon, Maquassie, and Bamber.

There are several tracts of bush, the trees being mostly mimosa. The hills in the eastern portion are not extensive; at Klerksdorp there are several of igneous formation; at Setlakoola, the Swart Kop is a very picturesque range, and well wooded. Extensive districts contain fine slate and sandstone with mica. The country between the Harts and Molapo is more open; few farms, and those are within the boundary of Griqualand West. The rest is open Kaffir land, and thinly populated, except at the kraals, Sehuba, Towns, Kopong, Morequern, Honey Vlei, Kuruman, and many small kraals; extensive open plains extend in length upwards of 200 miles from the source of the Molapo; and there are also long stretches of bush and small mimosa trees. The other rivers, beside the Harts, that drain the country south of the Molapo, some of which are tributaries of the Molapo, are Setlakoola, the Moretsane, and the Kuruman; the two former rise in the high veld, the latter springs from a large fountain a few miles south of Kuruman, and passes through the desert to the west, entering the Hygap below the great bend: there are several small watercourses leading into this river. The limestone ranges of hills are extensive. The Campbell range commences near Towns on the Harts, and runs in a south-west direction to Campbelltown, on the Vaal. The Kuruman range from Kuruman to Griquatown, also of limestone formation. Langberg, a lofty range, commences south of the Kuruman river at Cowie, and runs due south to the Orange River. The Scheurberg, a peculiar and picturesque range from the many-pointed peaks, is 25 miles west of Langberg, the south end joining up to the Orange River: this isolated mountain stands alone in the open flat and barren desert. The different tribes living in this part of the country are principally of the Bechuana families, Griquas, Korunnas, and a few mixed races. The English towns on the Vaal are Klerksdorp, Bloemhof, Christiana, Hebron, and Barkly; the latter is in S. lat. $28^{\circ} 30'$, E. long. $24^{\circ} 41'$. Several of my longitudes have been calculated from this fixed point, which is correct. The country is very healthy and extremely dry.

The rivers that drain the central part of the Kalahara are the twin streams Nosop and Oup, appropriately called twins, as the two join

for 20 miles and again separate, both entering the Molapo close to the great bend ; the Nosop rises in the Waterberg of Damara-land in two head-waters called the Black and White Nosops, which join north of Westly Vale and join the Oup at Narukus. The Oup rises in Damara in lat. 22° , under the name Elephants river, and gathering the waters of other small branches, joins the Nosop at Narukus for 20 miles, then becomes an independent stream, and falls into the Molapo. Several shallow watercourses traverse the desert, but are not of sufficient importance to merit a place on the map. Water remains in portions of these rivers in pools throughout the year. From December to May, the rainy season, water is plentiful; at other times it can be obtained only by digging in the beds of the rivers. At Meer, a Bastard station, there are two large pans, with permanent water. These people, descended from the early Dutch Boers and Hottentot women, have established themselves at Meer, and formed a kind of petty republic, which is daily increasing in importance, and when more powerful will give trouble. Their servants are the Bushmen of the desert, which they forcibly take as slaves. Dirk Philander is their magistrate, and holds his court once a week; I attended several. They are so far removed from the colony that they find they can do as they please.

Twenty miles south of Meer is an extensive vlei, called Hogskin, in length 33 miles, and at the south end there are two fine conical hills, which are very prominent objects, visible 60 miles off, and as they stand alone, surrounded by bush and the vlei, they add greatly to the beauty of the landscape. The highest is 415 feet high from the base, and as I made it one of my principal trigonometrical stations, having so commanding a view, it was an important point for my triangulations. There are three small rivers that feed Hogskin Vlei, viz. the Snake, the Moi, and the Knaas. After heavy rains the vlei is full, and forms a fine sheet of water, which it retains for some months, but it is frequently dry; wild fowl and game frequent it in the rainy season. Near these two conical hills, which are called Base Kop, I obtained several good specimens of coal from the banks of the rivers and also from the side of the hill. About 20 miles to the west, slate and shale form the beds of the rivers Snake and Moi, and on the Knaas river is a conglomerate of limestone, greenstone, and garnets. Some specimens of these rocks I sent to Mr. Southey, when Lieutenant-Governor of Griqualand West. This part of the desert is full of bush, kameel, dooms, and other trees, and is diversified by long, low ridges of sandstone, limestone, and many low hills of granite. During the rainy season vegetation is splendid, and the grass fine and plentiful, consequently game is abundant; it follows as a natural consequence that lions, leopards, and many other species of feline animals are numerous. This is truly the lion veldt; I have counted at one time in a troop, great and small, twenty-two individuals, frequently six and seven in the middle of the day, and

within a short distance from my waggons, on their way to the water, near which I have been outspanned. This country was formerly also the great ostrich district; I have seen over two hundred in a troop, early in the morning, but they soon scampered away on seeing my waggons; they are now fast disappearing, under the Bushman's arrow and the huntsman's rifle, but the great loss is in their eggs, felt by all who visit that region. This desert has been considered an uninteresting and barren waste, but it is not so; there are portions, it is true, that cannot be traversed during the dry season, several who have attempted to penetrate it having been obliged to come out and leave their wagon, their oxen all lost for want of water; but this was in a great measure their own fault, for if they had followed up the rivers and dug in their beds, they would have obtained it. There are many miles of limestone flats, some extending 10 miles in length, bounded by sand-dunes and isolated koppies, with their pointed summits covered with bush. The rolling plains and bush-covered low hills, with the distant mountain peaks that bound the horizon, the perfect calm and silence that pervade everything around, the variety of game seen in all directions, the very loneliness of the position, being at least 250 miles from any white man, surrounded by a few families of the Bushman tribe, who now live in all their natural innocence, as their forefathers lived in prehistoric ages, add immensely to the pleasure one feels in viewing a scene so novel and so seldom to be enjoyed.

The most peculiar feature in this region are the sand-dunes, mentioned above. These dunes extend for many miles in every direction; they run due west and east, and in altitude from 50 to 200 feet. Their base is a dark limestone covered with sand, which varies in thickness from four to ten feet. Their sides are at an angle of about 30° , and the topmost ridges so pointed, that when a waggon and span of eighteen oxen arrive towards their tops, the whole span is descending on the other side as the waggon reaches the summit, and the driver on the box can only see the four after oxen; but from the great depth of sand in the road, the waggon glides down with ease, although going at great speed. To illustrate more clearly the shape of these dunes, I can only compare them to a very stormy sea, with gigantic waves, instantly turned into sand; many small trees and bushes grow on their slopes, and also beautiful grasses. From six to eight miles a day with an ox waggon is considered a good trek. There are some small fountains and vleis in some of the hollows, otherwise no one could pass that way, as the road over these dunes from first entering them is 30 miles, then a flat of 8 miles over limestone and sand-dunes again.

There are also many isolated conical granite hills, that rise from the level plains to an altitude of 200 feet, formed of huge blocks, which can be seen at a great distance; they more resemble artificial than natural

monuments. I found them of great service in my triangulations; the atmosphere being so clear and dry, objects at great distances can be distinguished. There are many of these pyramidal hills in the southern part, near which my base line was laid down, in length 10 miles at first, but I increased it to 42 miles on the open plain, both ends terminating at elevated points that could be seen at long distances, and being on the meridian.

The Back river commences in a range of the Brinus Mountains, of granite formation, a most picturesque group of lofty hills, well wooded in the kloofs and ravines. The peculiar feature of this river is that it has two outlets, one to the east into the Hygap, the other to the west into the Great Fish River. Several small kraals are on its banks, occupied by various tribes. South of this river, and between the Hygap and Fish River, three mountain streams drain the southern Kalahara, viz. the Nisbet, Aamo, and Keikab, which fall into the Orange. This district is also of granite formation. This part of the country is good for sheep and goats, and large flocks are raised yearly, and soon get fat from the Karroo bush that grows on all the lowlands. Rain seldom falls, and the country is very healthy. The people comprise nearly every tribe of South Africa.

THE GREAT FISH RIVER AND GREAT NAMAQUA-LAND.

The source of this river is in Damara-land, S. lat. $22^{\circ} 40'$, at an altitude of 6400 feet; it flows south, and enters the Orange River about 90 miles from its mouth. The country through which it flows is very dry from the scarcity of rain. There are no important streams on the east, but on the west there are many tributaries that drain the high mountain country: the largest is the Amhup. The geological formation is granite, gneiss, trap, and amygdaloid. From the magnitude of this river it is evident the country at one time must have been well supplied with rain, as it is a deep, broad, and stony stream, showing how rapid and deep must have been the flow of water down it. There is another small river on the west coast, the Little Orange; its source is in the highlands, and it enters the South Atlantic at Angra Pequena Bay. The coast-country is a sandy desert, the sand forming steep ridges, extending 70 miles inland, until they join the mountain slopes. Wood is plentiful in the kloofs and on the hill-sides; some of the mountains are very bold, some exceed 8000 feet in altitude. Upon this river and its tributaries live the tribes called the Veldt seond-drawers and Bundleswaarts, who are distinct from their neighbours the Hottentots, Korunnas, Bastards, Kaffirs, and Bushmen. Some of the former cultivate land, use the plough, and keep cattle and sheep; they live near the small fountains and along the river banks, where they procure water by digging in the beds of the rivers, and roam from place to place as water fails. The tribes live under petty captains; there are several

mission stations, Bath, Bethany, Bethesda, and others. Copper is found in many parts of the country, and copper mines are worked in the south near the Orange River, which is the southern boundary; the Kalahara is the eastern boundary, Damara the northern, and the Atlantic the western.

THE RIVER SWAKOP AND DAMARA-LAND.

The Swakop river and its tributaries, including the Kennop, drain the greater part of this country. This river rises in the desert as far east as 17° E. long., and flows west and enters the Atlantic in Walfish Bay in S. lat. $22^{\circ} 45'$, and E. long. $14^{\circ} 33'$. The upper portion passes through a fertile country and between lofty hills of granite; some of them exceed in altitude 8900 feet. The lower portion passes down through a sandy and barren waste. The mountain regions are more thickly populated than the lower lands. The eastern portion has extensive grassy plains, and portions well wooded, particularly in the kloofs of the mountains. The mineral wealth of these parts is little known, but from the slight inspection I was able to make, and the specimens I obtained, I believe it will be found to contain lead and copper. Copperworks were established many years ago on the Canna river. The other rivers of less note are the Kuisip, south of the Swakop, which drains the country between Great Namaqua and Damara lands, from the eastern mountains at an altitude of 8000 feet. The other rivers north of Swakop, and which drain the western division, are the Omaruru, and four others to the north, which I have not been able to explore. Their sources are in the high tableland and mountains to the east, which average in altitude from 2300 to 4500 feet, but water never flows in any of these rivers, except in very extraordinary rainy seasons. The south-east boundary is drained by the Black and White Nosop and the Elephants river, which I have previously described. The eastern division is drained by the Omuramba, passing through a thick bush country and open grass lands, upon the banks of which there are many kraals, then turns east through an open country, uninhabited, and south enters the Nosop. This river is more properly a laagte or shallow water-course. The coast-line extends as far north as the Cunene river, which is also the Portuguese boundary, and southward to Walfish Bay; and for 70 miles inland, as far as I have been, it is a sandy desert, similar to the coast-line of Great Namaqua. The Damaras live on the open plains, and along the springs and watercourses. I have not been able to obtain any statistics of the number or variety of the tribes, not having explored the whole of that region. The Damaras and Berg-Damaras both speak the Otjiherero language. There are many other mixed races spread over the country, and great numbers of cattle, sheep, and goats are kept by them. The produce of the interior consists of ivory, feathers, skins, and other articles, which the traders purchase,

and ship at Walfish Bay. Several mission stations are established in the country. In 1875 the Cape Ministry decided to annex Damara-land to the Cape Colony, and Mr. Palgrave was appointed, and His Excellency Sir Henry Barkly recommended that I should be Mr. Palgrave's co-adjutor. The Ministry demurred at the expense, therefore Mr. Palgrave was sent, and after much trouble and delay, Walfish Bay has been added to the Colonial possessions.

OVAMPO-LAND.

This extensive region is situated to the north of Damara-land; its eastern boundary is the Kalahara desert, and on the north-west the river Cunene and the Portuguese settlements form its limits. The high tableland extends over the whole of this region, and is exceedingly healthy, the highest altitude being 5300 feet, as far as I have been able to take them. The Ovampos have large herds of cattle, sheep, and goats, and cultivate corn extensively. The people are very black, finely proportioned for strength, and are hard-working and industrious. They speak the Otjiherero tongue, and are very jealous of strangers. The only other river not yet described that drains Ovampo-land is the Ovampo laagte, which commences on the west of the central watershed, at an altitude of 4200 feet, and in S. lat. $19^{\circ} 20'$ and E. long. $18^{\circ} 56'$, then passing north-west, through the Great Salt Vlei, it falls into the Cunene river, and thence to the Atlantic. The country is said to be rich in minerals, but my time was so fully occupied in exploring and taking observations, that I could not devote any attention to the search, and the natives besides were suspicious as to my movements. Ovampo-land is one of the most beautiful portions of this part of Africa; picturesque mountains, lovely open glades, well-wooded districts, a rich soil for corn, a dry and healthy climate, make it a desirable country to live in. But time was of consequence: and I was anxious to finish my work during the favourable season. I left Otabengo on the 10th of September, 1869, and proceeded along the laagte called Okayanka, which passes east and enters the Tonka; it rises in S. lat. $17^{\circ} 48'$, E. long. $17^{\circ} 50'$. At Chambombo Vlei, between this and the Ovampo river, we cross the great watershed. Game of every kind is to be found here, the elephant, rhinoceros, giraffe, eland, sable antelope, gemsbuck, and a variety of other kinds of antelopes, the ostrich, zebra, buffalo, wild hog, &c. Leaving Ovampo in a north and north-east direction through the Batibe country, by slow stages along the numerous pans and vleis, hunting on the Okayanka laagte, to rest and obtain specimens of the flora, which is particularly rich in the variety of the plants, and also some rare geological specimens, I proceeded on the 2nd of October, travelling 70 miles with little water, and arrived at the Cubango; the country was difficult to travel, in consequence of the thick bush and timber, but there are large open plains, with palms and baobab trees

standing out, the giants of the forest, and other tropical trees and plants. I halted at a small village of the Kásáká Bushmen, which I named my station, and from this point I followed up the river. But before proceeding further, as I am now in the northern regions of the great southern desert of Africa, I must describe its extent, position, and boundary, and then complete my account of the river system which drains it.

THE KÁLÁHÁRÁ DESERT.

Noting the pronunciation of the Bushmen when naming this desert, I have spelt it accordingly, and believe it to be correct. The spelling corresponds with Námáquá, Dámárá (Sáhárá of the north), Mákárákára Salt Vlei, Mákálákára pits, and many others. The boundary of this vast and interesting region comes down south to the Orange River, S. lat. 29° , which is also the northern boundary of the Cape Colony, and extends north to the 16° S. lat. as far as my explorations went, with the exception of the river Cubango, up which I ascended to 15° S. lat. The western boundary is formed by Great Námáquá, Dámárá, and Ovampo lands. On the east, it is bounded by the river Chobe to the Zambesi and Victoria Falls, then due south, it skirts the eastern bank of the Great Mákárákára Salt Vlei, where five streams enter it from the watershed, viz. the Nata, Quabela, Shuari, Mia, and Tua; thence the boundary runs south to the Mákáláká pits, a few miles to the west of Mongwato station (this station is very seldom called Ba-Mangwato), from those pits due south to Molopololo's, on to Kanya, and Maceby's station on the Molapo, down that river to Conge, Honey Vlei, on to the north point of Langberg range of mountains at Cowie, down that range south to the Orange River, a few miles above Kheis. The length of the Kalahara from north to south up to 16° is 900, and to Kabano on the Cubango 970 miles, but from information obtained from the Kásáká Bushmen on the spot, I believe it extends much further north. The greatest breadth is about 500 miles, from east to west. There are only two more rivers to describe which rise or flow through the region, viz. the Chobe and the Cubango, besides Lake Ngami and Zouga river. The Chobe rises much beyond the point surveyed, viz. in S. lat. $16^{\circ} 35'$, E. long. $21^{\circ} 37'$, where another branch enters it; from this point the Chobe takes a winding course through a level and swampy country, full of jungle, past a Kaffir kraal, Matambaya, to within 70 miles to the west of Linyanti, past that chief's kraal, in an easterly and north-easterly direction; it enters the Zambesi 37 miles above the Victoria Falls. The Chobe is a large and broad river with several rapids. There are many streams and laagte which intersect this extensive and swampy region, but like the Mábábe, water seldom flows in them. It is a most unhealthy and sickly country, whence it has obtained the name of the Fever District. Extensive tracts are uninhabited; some of the natives

build their huts on piles near the streams, and when the Mábábe is full the hippopotami visit it from the Chobe, and the Kaffirs come in their canoes to hunt them. The scattered races who live in these parts and along some of the vleis and pits are the Makuka, Banyeti, Bakana, Batiutie, Luinas, Barotse, Mákalaka, and a few Bushmen. Laagtes, pans, and vleis are found in every direction.

The Cubango River.—The source of this river is much further to the north than my explorations extended. I followed it up to about the 15° S. lat., from my station on the river at a Bushman kraal, S. lat. 17° , E. long. $19^{\circ} 56'$, at an altitude of 3370 feet above sea-level; from that station the river runs in a north-west direction for 80 miles, then turns a little east of north for 30 miles, where there are two branches, one continuing in a north-west course, the other almost due north to a Bushman kraal, with a few windings for 53 miles, passing through a thick forest and bush. From my station the river, downwards, flows in a south-east direction for 55 miles to Libebe kraal, then in an easterly course winding through the desert for 65 miles to Debaibe's kraal, S. lat. $17^{\circ} 22'$, E. long. $21^{\circ} 30'$, where the altitude is 3150 feet. At this station it turns south, and receives a new name, the Tonka, continuing with many turns and windings for 220 miles, finally entering the north-west corner of Lake Ngami at an altitude of 2813 feet above sea-level, in S. lat. $20^{\circ} 25'$, E. long. $24^{\circ} 45'$; in its course there are several falls and rapids, i. e. when it has water in it. The general configuration of the northern Kalahara, between the Chobe, Cubango, Tonka, and Ovampo and Damara lands, varies in character. Between the two former rivers the region is flat, and full of swamps; to the west it is undulating, with a gentle rise, until it forms the central watershed. The greater portion is thick bush; there are also extensive open plains, with dry laagtes crossing them towards the east. Large and small game abound. The greatest altitude of this region is 4320 feet, viz. on the watershed in Ovampo-land. South of Lake Ngami, a range of hills, called the Makkapolo, stretches in an easterly direction, which to the south-east are 4010 feet in altitude, 40 miles to the south-west of the lake 3500 feet, but continues rising towards the west until it attains 4000 feet on the watershed. All the rivers on the western slope flow into the South Atlantic, those on the east into the Indian Ocean. The usual tropical trees grow throughout this region, and many beautiful shrubs and flowers. From the elevated positions, fine views can be obtained of distant land which is most favourable for observations. The produce of the country is collected by the hunters who visit the country from Damara-land and the lake, and also by some few Portuguese who occasionally visit it. Bushmen are the only permanent inhabitants: the Mesere, Kásáká, and the Kaikabrio families, who live in caves and hills and small kraals, in the bush. Some of the Batibe tribe live at Serela and other kraals. Many of the border tribes go in to hunt, but do not remain; they may be seen

occasionally in small parties traversing the desert with one or two pack oxen, loaded with dried game and such feathers they may have obtained by the rifle or stolen from the Bushmen they may have surprised. In my journeys through the desert, I was always accompanied by several of these Mesere Bushmen and their families, which was a great help, as they took me to watering-places unknown to hunters, and were my guides in places I should not otherwise have visited. I found that if you treat these people well, they are willing to assist in any way. They are a small race, seldom exceeding four feet ten inches in height; when old, which is at the age of forty, they are very ugly. Their food consists of game, which they kill with their bows and arrows, eggs, roots, mice, locusts, insects, the large black frog, which measures a foot across the body, and land turtle, besides any filth they may pick up. When I was in this region in 1872, I wrote to His Excellency Sir Henry Barkly, then Governor at the Cape, describing these people and the tortures they suffered from the border tribes, and the slavery carried on by them; but these things will be fully explained in the work which I am completing.

The main transport road from Walfish Bay to Lake Ngami, through the desert, is not the only road; there are many traversing it in all directions, made by hunters, traders, and such natives on the border as possess waggons.

The eastern division commences at Lake Ngami. This particular region requires some explanation as to the altitudes of the various sources of the different rivers that occupy the northern portion. I found the heights given by other explorers somewhat erroneous and therefore paid particular attention to this branch of my work. The great test was at Lake Ngami, Mákárákárá Salt Vlei, and the junction of the Mábábe with the Chobe, which gave at all these three points the same altitude, within a few feet, by the aneroid barometers; and the proof of these levels at these stations was, the level of the water at the same time being the same, viz. 2813 feet. Lake Ngami is 45 miles in length; on the eastern side the Zouga river joins it, sometimes flowing into it, and sometimes out; the direction of the current depending on the rainfall. The Zouga from the lake winds easterly through a flat country, and joins the Mákárákárá Vlei; the Zouga having such a perfect level, the water in April and May flows easterly, in June and July westerly. The only outlet for the surplus water of the Zouga, lake and vlei, is the Mábábe into the Chobe; and when all are full and no stream flowing, the water in the Mábábe goes north or south according to the rain. If a great rush of water comes out of the lake or vlei, the Mábábe is the outlet which connects the lake system with the Zambezi. The Mábábe in the dry season is a laagte or dry watercourse; gigantic trees grow on the more open flats, and the palm, mopane, and other tropical trees and shrubs.

The rivers Daka and Zimboya fall into the Zambezi about 70 miles below the Victoria Falls, the altitude of the falls being 2580 feet. South

of the falls there is a range of hills running west and east to the river Gwaii, the highest point being 3900 feet, which is on the east of Daka. From its southern base the land gradually slopes to the south until it reaches the Great Vlei and the Zouga river, at an altitude of 2813 feet. The country is deep sand; the sickly season is from September to May. South of the Zouga down to the Molapo river, the land again rises until it forms the central watershed at an altitude of 4260 feet. The whole of this part of the desert is thick bush, but scarce of water in the dry season. There are some permanent pits and small vleis; the larger pans hold water only in the rainy season. The principal inhabitants are the Bushmen, and some of the chiefs, such as Khama, Sechele, and Gaseitsive's, are Kaffirs, who live at permanent watering-places and have many kraals within their respective boundaries. A large portion of this part is claimed by each chief.

The mountain range dividing this eastern portion from the western part of the desert, commences about 100 miles south of Lake Ngami, taking a southerly course to the Molapo river, in a line with Langberg, before described.

The principal inhabitants near Lake Ngami are a branch of the Bechuana family, Makalaka, Korunnas, Bushmen, Hottentots, and a variety of other races, all living under the young chief Molemo, son of Leshulotabes, whose kraal is on the east side of the lake. There are several petty chiefs living on the river.

The great watershed of South Central Africa, dividing the waters which flow into the South Atlantic from those flowing into the Indian Ocean, commences much beyond the limit of my explorations. At the point where I took it up the altitude was 4100 feet; from there it takes a diagonal course across the desert in a south-east direction, at various elevations, as given on the map, to Lichtenburg, a town on the western boundary of the Transvaal, where the altitude is 6100 feet; from that town it takes a turn to the east, running between Potchefstroom and Pretoria on to Lake Cressie (6300 feet), then it suddenly bends to the south-west along the Drakensberg range, forming the western boundary of Natal, down to the Giant's Castle, where the altitude is 10,000 feet above sea-level.

The watershed between the Zambezi and Limpopo basins commences in the desert at Káikáí (4260 feet), striking north-east, passing east of the Great Mákárákárá Vlei along the tableland, past Gubuluwayo to Sakaloto. At that point the altitude is 4210 feet; the highest point reached was 4800 feet.

THE EASTERN DIVISION OF SOUTH CENTRAL AFRICA.

Having described the western division of this part of the continent, it will be necessary to explain the geographical features of the eastern, comprised within the map.

The Limpopo river, sometimes called the Crocodile, the source of which is on the northern slope of the great watershed, south of Pretoria in the Transvaal, flows in a north-west course to Marico, thence north to the great bend, where the river makes a turn to the north-east and east to E. long. $31^{\circ} 56'$, then turns south-east through a very flat country, and enters the Indian Ocean. Many important rivers (tributaries) flow into it, draining an extensive surface. The southern tributaries are not surveyed or properly explored, therefore I have not shown them. I take only the western and northern branches, viz. the Great and Little Marico, the Notuane, the Makalapsie, the Setuane, the Serubie, the Pakwe, the Maclutsie, the Shasha, the Mekhoe, the Rubie, the Nuanettie, and their several tributaries, which drain the country on the eastern side of the watershed.

The Great Marico rises in the Marico district of the Transvaal, where the Little Marico and Molmána rivers enter it above. The Molmána in its course forms large vleis, one below the other, where the hippopotamus a few years ago could be found; now they are the retreats of the python, which attains great size: I shot one 16 feet 2 inches in length and 2 feet 4 inches round. The eye of this river is only distant from the eye of the Molapo ten miles, the central watershed dividing them. The Great Marico turns north and enters the Limpopo, lat. $24^{\circ} 15'$, altitude 2690 feet. This river drains one of the finest and most valuable portions of the Transvaal, both as an agricultural and mineral district. Quartz-reefs cross it in every direction—lead, copper, and gold. A lead mine is now being worked by an English gentleman, who can turn out several tons of lead per day, and the proportion of silver to the ton is found to be 50 ounces.

The Notuane river is the next tributary of the Limpopo, and is an important stream, in consequence of its passing through a rich agricultural and mineral district, occupying an extensive area; the part adjoining the Transvaal is farmed by English and Dutch farmers, the other parts belong to four Kaffir chiefs, living at Rinokano, Ramoocha, Kanya, and Molopololo. One principal branch rises near Zeerust in the Transvaal; the other, in the desert, with many small branches and fountains falling into them, supplies the country with sufficient water. The country south of Koloben to the Transvaal boundary is exceedingly fertile, and produces superior corn crops, and extensive herds of cattle, sheep, and goats. All vegetation seems to thrive and arrive at perfection. This district is intersected by lovely mountains, well wooded, and park-like valleys; the roads good and level; tropical plants grow wild on the hills and plains. The winters are mild, and it is a most healthy district; under an industrious white population it would become one of the richest portions of South Africa, as it is now the most beautiful, and would support a population five times greater than the present number of Kaffirs living there. In the mountains near Ramoocha,

the kraal of the chief Macose, gold is found, and in many other parts I believe it exists. I have found copper, lead, plumbago, and most valuable earths. Iron of the best quality is found at nearly every turn; the natives manufacture their picks from it. Some ancient furnaces still exist in the mountain kloofs where copper was smelted. The natives will not allow the country to be properly prospected, but when the country up to the Zambesi is annexed to the British crown there will be no difficulty in properly developing its resources.

The chief Khama and the rivers in his territory are to the north of the Notuane. Khama's head kraal, Mongwato, is situated partly in the bed of an ancient river and in the kloof of the mountains, which formed a tributary of it; from which and from a small brook running through the centre of the ancient river, the natives obtain their water, the brook falling into the Limpopo; it is too small to note here, but is shown on the map. North of Mongwato is the first important river, the Makalapsie, then follow the Setuane, the Maclutsie, and the Shasha, with their several branches, the latter river being the boundary of Khama's country on the north. They take their rise from the eastern slope of the watershed which divides the Zambesi and Limpopo basins, and fall into the Limpopo, passing through a dense bush, and between lofty hills of granite formation. This country is called Doorst-land, from the dryness of the district; but vegetation thrives, although no rain falls from April to November, and frequently not until the end of December: grass is plentiful, and trees and bushes do not seem to suffer. Water is seldom found in the rivers, except by digging. In the rainy season most of the rivers are full, and come down with great force. The consequence is, this district is not inhabited by any of Khama's people, as they can find more suitable locations elsewhere. Kaffir posts are on the Makalapsie, and from that river north to the Shasha, a distance of 100 miles, only a few Bushmen are to be found, who have to shift their quarters as the supply of water decreases. There are several mountain ranges passing through, and in detached bergs; some granite, others metamorphic, gneiss, oolite, and slate. This chief's territory is very extensive, and extends up to the Zambesi Falls.

Lo Bengulu, the Matabele king, endeavoured a few years ago to claim all that part of the country even as far as Lake Ngami, and sent an army in to clear the region of all the cattle. They penetrated some distance, and swept away many hundred head, but have never been in since, and Khama has the country, and rules the people in it, and grants to white hunters permission to hunt, the boundary between these two chiefs being the river Shasha up to the Tati junction, up the latter river, and then the waggon road to Daka and Victoria Falls. Khama's kraal was formerly called Shoshong, and sometimes Ba-Mangwato. His tribe belong to the Bechuana family; the northern part being inhabited by the Makalaka, Batlele, Barute, and others, besides

a few Bushmen. Large and small game of every kind is to be found in this region. In the southern portion, but more particularly in the Kaffir ground by the diamond-fields, many ancient carvings on the rocks are to be met with, representing animals, snakes, and men. I have a sketch taken from a large igneous rock, of a landscape, with figures, and a snake in a tree giving a ball or some kind of fruit to a figure standing near; the implement used to cut the figures must have been very hard. This rock stands on one of the tributaries of the Limpopo. I have nearly 200 drawings of these carvings.

Matabele-land and the Mashona country extend to the Zambesi, and as far east as the Sabia river and Umzila's country. The principal rivers and tributaries of the Limpopo that drain this region on the south side of the watershed are the Shasha, Tati, Ramakaban, Mpakwe, Meksine, Rubi, and Nuanettie. The eastern part is drained by the Lundi, the Tokwe, and the Sabia rivers, which fall into the Indian Ocean, south of Sofala; all these rivers rise from the southern base of the watershed, which is of granitic formation. Many of the spurs stand out in bold and picturesque forms, and in isolated koppies formed of immense granite rocks, in grotesque positions, to the height of several hundred feet, from which grow fine and beautiful trees, shrubs, and flowers, greatly increasing the beauty of the landscape. Gigantic baobabs, palms, euphorbias, aloes with their crimson flowers, and other tropical trees skirt the hills and mountain streams. The fallen masses of rock from the pyramid-shaped hills, give a strange and peculiar feature to the scenery around. This country gradually descends towards the south and east, until it reaches the Limpopo and Sabia, interrupted by isolated hills and mountain ranges, thickly wooded; the most inaccessible points being selected by the Mashonas for their kraals, to be secure from any surprise of the Matabele warriors. The population of the eastern division is mostly composed of the Mashona tribe and Banyai, as well as the Makalakas; the southern part by the same races, and many of the Makloes, Makatse, and Mantatees, that have crossed the Limpopo from the south side. The Tati gold-fields occupy the western border; the whole of the lower portion of this region is called the Makalaka-land. Gold is found in many of the rivers, and also in quartz, but no one is allowed to prospect. There are many large military posts on the slopes of the watershed, down to Makobi's post, which is their frontier outpost. Although the Matabele country comes down to the Shasha river, no one occupies that district except a few wandering Bushmen. There are many ancient forts, the ruins of which are still to be seen on commanding positions, but none of any great extent; they have been built of hewn stone; the most perfect I have sketched and made ground-plans of: many are so concealed from view by trees and bush, that it is by mere accident they are discovered. Along the Sabia, Lundi, Manica, and at many other places, they are to be frequently met with. The

natives state they were built by the white men that once occupied this country, whom they called *Abberlomba* (men who made everything); the stone used was granite, and hewn into blocks, without mortar, but many had concrete floors. The rivers on the north slope of the watershed in Matabele-land are tributaries of the Zambesi, rising in the mountains on that granite range, and with their many and important branches drain an extensive area. The first is the Gwaii. The altitude of the source of this river is 4800 feet; the rivers falling into it are the Inkokwasi, Umvungu, Chamgani, Kagane, Umkhosi, Kame, Mapui, Amatza, Amaboguana, and Umfulamokogumale, which supply the country with water, upon which are situated many of the most important military kraals, viz. Amaboguana, Inyatine, Umkáno, Umganine, Umhalbatine, Umslaslantala, Gubuluwayo, Umgamala, Umlambo, Umshangiva, Manpangi, Mthlathlagela, and many others. The Gwaii enters the Zambesi in S. lat. $17^{\circ} 54'$, E. long. $27^{\circ} 3'$, passing through the Abutua district, which is thickly wooded, and has few inhabitants. The next rivers are the Umnyaki, the Umvule, and the Mazoe, and their several branches. The country is very hilly, clothed with dense bush towards the Zambesi, but having no Kaffirs beyond the slopes of the watershed. Corn, rice, and vegetables are grown by the Mashonas, and more to the east cotton is cultivated and manufactured into blankets and other clothing. There is also a wild cotton, called *olundly*, but it is not used, except for tinder. The country is similar to that on the south side of the watershed. The altitude of this range averages 4320 feet; many old gold-diggings are to be seen along the slopes of the hills, where quartz crops out, and the country has every indication of having in some remote period been extensively worked.

The Mazoe river rises in S. lat. $17^{\circ} 56'$, E. long. $32^{\circ} 20'$, at an altitude of 4210 feet, and flows in a north-east direction towards the Zambesi. The Sabia river rises only a few miles south of the source of the Mazoe, and flows south down to lat. 21° , then turns south-east to the junction of the Lundi river, and then easterly and enters the Indian Ocean. Many tributaries from the watershed flow into it, and also some small ones on the eastern bank, particularly the Manica. At the sources of these rivers the country is thickly populated: there are several extensive kraals, Gangwesi, Mebka, Sakaloto, Gansuma, Umsose, Kombise, Umtigesa, and many others: many of these Mashona chiefs are almost free from Lo Bengulu's rule; Umtigesa, Selumbom, Whiti, and Gutu, are some of them; there are others, but I do not know their names. The land is capable of growing everything that is required, all kinds of grain, vegetables, fruits, rice, cotton, indigo, spices, oranges, lemons, besides the native wild fruits. There are lofty mountain ranges towards the north, the native name of which is Leputa or Lebolo.

On the east of the Sabia river the country is under the Zulu chief Umzila; his country includes many districts, known as the Birue,

Batoka, Sofala, and others, down to the Mandanda region. How far this territory goes north I am unable to say. Umzila's kraal is in S. lat. 20° 27', E. long. 32° 28', between lofty hills, the altitude being 3180 feet by aneroid barometer, and is situated on the river Buzi, which flows in a north-east direction and enters the Indian Ocean. The country is very fertile, and the banks of the Upper Sabia river, which flows down through rich plains, flanked by high and picturesque hills, are clothed in all the beauty of tropical vegetation. Mahogany, ebony, and other valuable woods are found; large flocks of sheep and goats, and herds of cattle are reared. There is also the large game and many other kinds to be found, and a very peculiar red squirrel with black tail. The coast-line of my map is laid down from charts which I believe to be pretty correct. The Portuguese have no control over any part of Umzila's territory, they only hold possession of narrow slips of land along parts of the coast, but not along the whole. This information I obtained from Mr. Baker and others who have been all through the Mandanda country to Delagoa Bay, Inhambane, Sofala, and other places, prospecting for gold and hunting. The natives offered no opposition to my visits, and were willing to barter food for articles of clothing, principally linen cloth; but in many other portions of the country I had to use great caution to prevent suspicion as to the object of my visits. In many cases I have passed through tribes who would have been troublesome, but as I took goods to barter, I was considered a trader, and as such one can journey almost anywhere. Some considered also I was a doctor or medicine man, because I caught and preserved insects, snakes, and other small reptiles, besides plants. When this idea takes possession of some of the African races, they leave you unmolested. Any injury they might inflict would be considered unlucky to themselves.

The country east of the Sabia to the coast has never been explored sufficiently, except a route thence to Inhambane. Therefore early in 1877 I made arrangements to proceed to that region in order to explore it and obtain cotton samples of the cultivated and wild cotton, for submitting to the Chamber of Commerce at Manchester. I had forwarded various samples in 1875 to the Earl of Carnarvon, then Secretary of State for the Colonies, and I also left with Sir Bartle Frere a few similar samples when in Cape Town in April 1877. On leaving the Cape to proceed on my proposed journey, I had the honour of receiving from His Excellency certain instructions for my guidance in prosecuting my explorations in the regions I might be able to visit, and which I carried out as far as I was able with the means at my disposal; but I was prevented from completing my work by the opposition of the Matabele king. Nevertheless, I extended my journeys as far as I was able through his country, and after visiting several districts in those regions and down the Crocodile river, and along the lake and river road,

returned to Molopolo in August 1878. There I received a letter from Sir Theophilus Shepstone, stating he would be happy to see me if I could make it convenient to call on my return. Consequently, I arrived in Pretoria early in September, and after writing out several reports for His Excellency, I proceeded to the eastern boundary of the Transvaal, on to Lydenburg, New Scotland, Lake Cressie, Wakkerstroom, Pongola river, then to Utrecht and Zulu-land, where I remained with Colonel Wood's column, but was unable to explore much, it being unsafe to extend my journeys far from the camp. Such portions as I was able to survey are shown on the map.

I have to observe, that after the diamond-fields had been worked some years, many gold prospecting parties started in various directions. There being no map of the country for their guidance, I hastily compiled one from my own surveys and others, which was roughly lithographed, and issued in 1873. In the same year I also made a map of a portion of the country, which I forwarded to the Royal Geographical Society. It was not published and did not embrace all my surveys. I have carefully corrected some errors, and made considerable additions, the fruit of six years' explorations in the interior since the former map was made, and now offer the present map to the Society.

My several journeys will be published separately, in a work I am completing, of my sixteen years' explorations in South Central Africa.

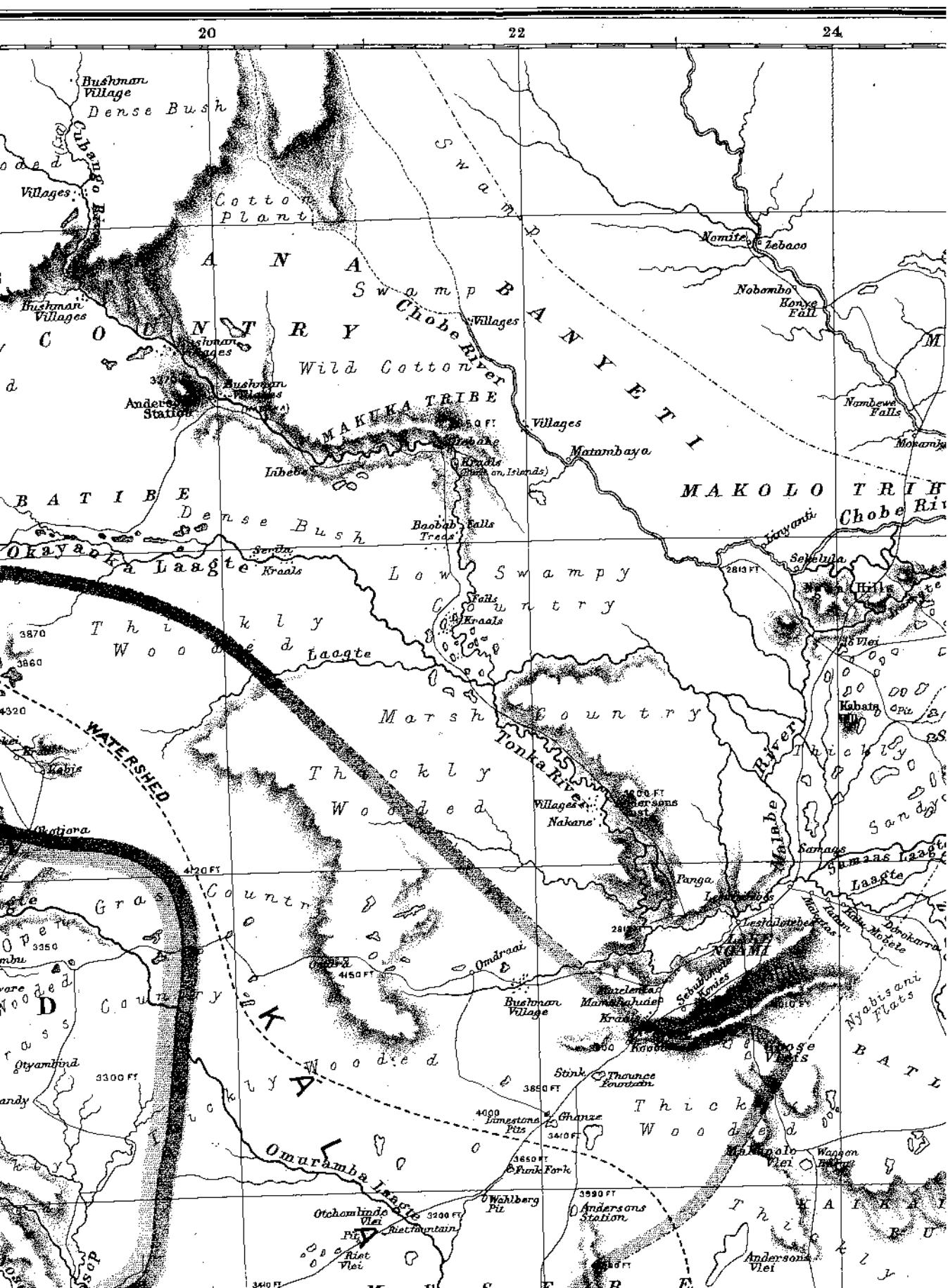
In conclusion, I have to observe, no mention is made of the difficulties I have had to overcome, the hardships, trials, and privations I have passed through, the losses sustained and the risks that frequently surrounded me in penetrating alone those distant regions. To have done so would have extended this paper to undue length.

When the lower Zambesi, the eastern coast-line, and part of the Transvaal province are correctly surveyed and explored, the map of the whole of South Africa up to the Zambesi will be complete.

GEOGRAPHICAL NOTES.

Exploration of New Guinea.—The result of the deliberations of the Committee, appointed at the Southport Meeting of the British Association for the purpose of considering the means of promoting the scientific exploration of New Guinea, has been to recommend to the Councils both of the British Association and of the Royal Geographical Society, the expedition now in preparation by the experienced traveller Mr. Wilfred Powell, as one likely to advance greatly our knowledge of New Guinea, and therefore worthy of their patronage. Our Council has accepted the recommendation of the Committee, and will endeavour to obtain for Mr. Powell the countenance of Her Majesty's Government. Mr. Powell's plan, as submitted to the Committee, is to ascend as far as practicable the





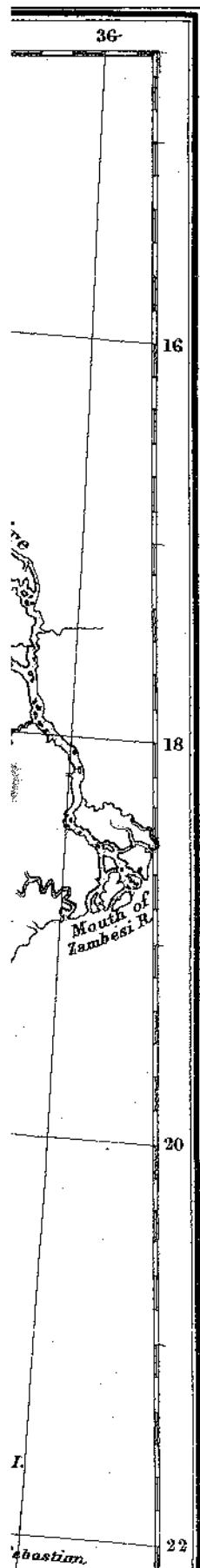
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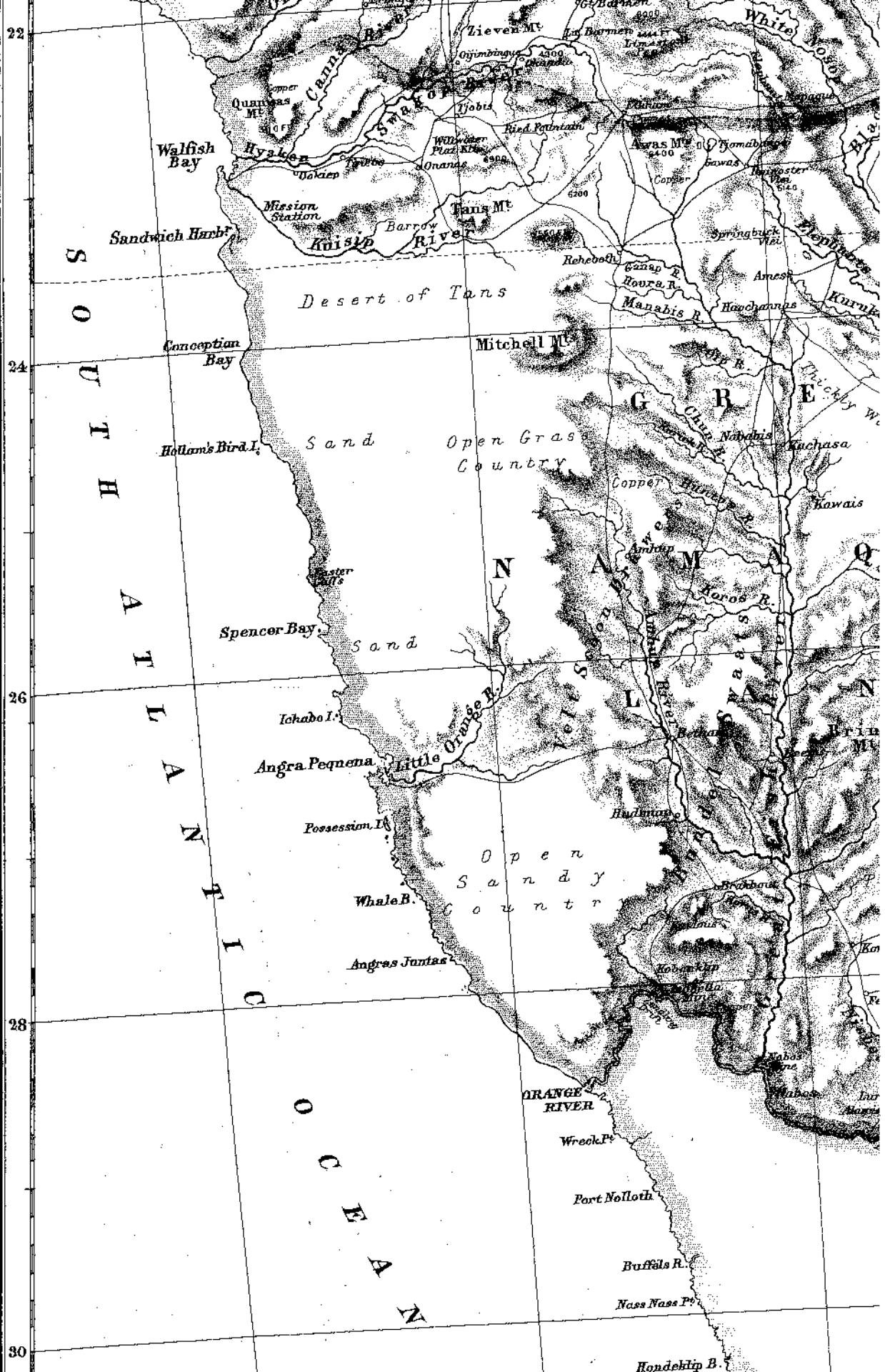
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THE INTERIOR
OF
SOUTH AFRICA
From Lat 15° to 30° S.
Explored and Surveyed by
ANDREW ARTHUR ANDERSON, C.E.

Scale of English Miles

100 50 0 100
1 Inch = 5 1/2 Miles

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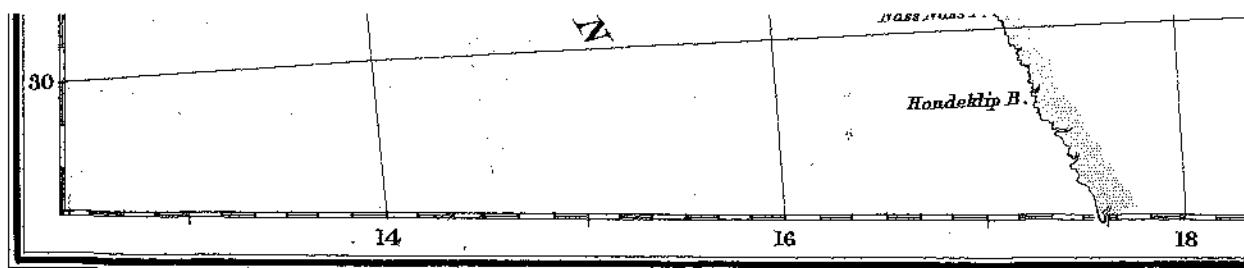


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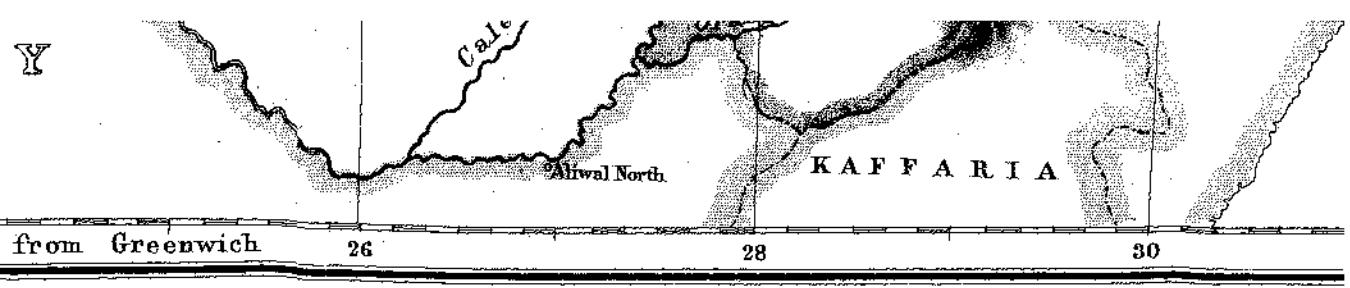
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Longitude East 24 from

Published for the Proceedin



Proceedings of the Royal Geographical Society, 1884.

Scale of English Miles

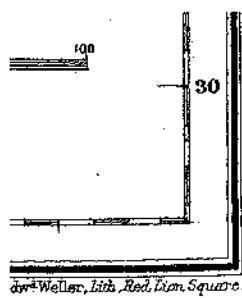
1 Inch = 57½ Miles

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34

36

Edw^t Weller, Lit



Mr. Weller, Lith. Red. Lion Square.