D^2-3. 128-1 sec. Our camp. Shows Mr. and Mrs. S. G. Shapcott, also Mrs. Boyd, H. C. Raven and our boys,--Dick, Jim, Joseph, Little Tick, Sixpence, Paruge, Chogofola Mosenti, William and Thomas. Mr. and Mrs. Schapcott, who have a Ford car, drove out on the opposite side of the river and persuaded us to return to Kafue until conditions were better. We made an effort to get off during the night, and I had succeeded in packing up my plants and seeds, photograph material, herbarium material, and pulling down my bed, when a violent chill came on, at the same time a very severe thunder shower, when Raven took charge and put me back in bed, where I stayed for the night. A terrifically heavy rain occured.

December 10, 1919. Up early the following morning and tore down our camp preparatory to leaving. The tent had to be taken down and transferred 1/2 or 3/4 of a mileto the river. Road across in a small boat and on opposite side loaded on to an ox wagon. Before leaving I secured samples of soil from long sloping area, between the cliff and the river. It seems to be unusually good land. It does not crack open and is relatively impervious. There was no difference in color noticeable at the different depths, but soil decidedly columnar and cracked at about 12 to 14 inches and on down for a foot or more. The soil was veyy hard, even after the rains we have had. Sample 17 taken at 1 foot; Sample 18 at 18 inches; 19 at 2 feet; 20 at 2½ feet; 21 below this

point. There is near here a great streak of grassland called a mopane flat. Apparently this is a great marshy area which is very wet during part of the year. Now it is very dry, cracked open, very open, and spongy, so much so it is almost impossible to walk over it any distance. The cracks are so large that I lost a relatively large wild cat on a perfectly open plain, it being possible for this animal to hide successfully in these soil cracks. The cracks extend down 1-3 feet. This area is covered withgeodes of calcydony, which may have washed down from adjacent hills. The vegetation is almost entirely of grasses.

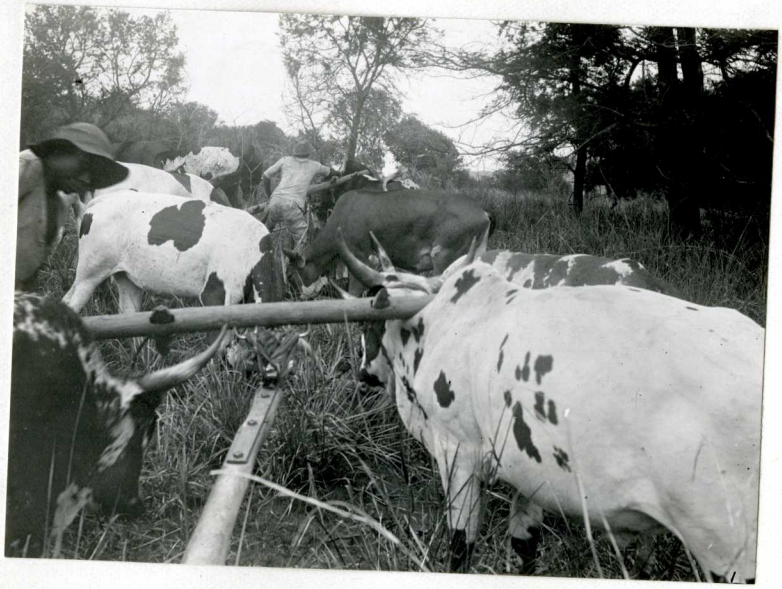
Shantz 354. May be the same as 74. See Herb. 483.

S.P.I. 49612. Printzia rufus, see Herb. 478. Somewhat similar to bachelor button, and a low perennial.

S.P.I. 49585. See Herb. 474, Cymbopogon/Printzia rufus. ~~See Herb. 478~~ One of the coarse grasses, probably one of the most prominent sour grasses of this section.

After having taken down our tent we succeeded in crossing the river and inspanned for the track to Kafue. This took some time.

s-5. Shows unloading at the Kafue river on the arrival on November 21.



s-6. Inspanning at the bank of Kafue on leaving December 10. Shows the native boys lashing the oxen to the neck yokes.

We were en route practically the whole day and arrived in Kafue at 3:30. Mrs. Shapcott assigned Dick, one of the Nyasaland boys, to give me his personal attention. Constant dosing with quinine, black-water-fever medicine, barley water. Succeeded in stopping the fever by the morning of the thirteenth, although it recurred many times afterwards. Usually for about 2 to 3 days each month.

Note on the Kafue.-- Nothing is lost if a zebra is shot on the Kafue. During one of the days in camp we proceeded east of camp for about 2 miles, then south-east over low mountain range for several hours. The caravan consisted of a tall athletic hunting boy, uniform shirt and shorts with brass-bound legs and spear, with lank hungry dog held in leash. I followed, helmet and all. Jim followed as gun-bearer with Newton 256 just behind, and behind him Remington automatic 22 with Joseph. The collecting outfit carried by Parugi and the old man Chogofola. We started in the dark of the early morning, going in single file as quietly as possible. At about sunup we were rewarded by seeing a zebra, a large fine animal which wheeled about at the top of the ridge and ran off with his herd. Only a second and no time to shoot. The hunting boy sprang aside in an inconceivable state of excitement and the dog broke his leash and bounded off after the herd. The zebra ran off up the side of the mountain, barking and barking. This at first we mistook for the bark of the dog, but afterwards found he had returned to his master's side and the barking continued as the herd ran out over the adjacent mountain side. After this confusion we started again.

Even under these circumstances it is difficult to keep your mind on the hunting and I find myself continually working over the problem of utilization of temperature data in the interpretation of conditions favorable or unfavorable for plant growth. With plenty of royal game ahead I find it

more interesting to think of the good which may come to agriculture by the proper application of physiology.

Then we spied an eland at some distance and finally arrived at the body of a zebra which had been shot by Raven the day previous. Theboys were told we wanted a small piece of meat for "scoff" (food), and that they might have the remainder, or as much as they wanted, which proved to be all of it. When we arrived we found there had been no carrion ahead of us. A single vulture had been there but left no mark on the carcass. Insects in myriads and maggots marched by the millions, in great waves, back and forth in the body cavity. Dung-beetles, scarabs, were fighting and scurrying about by the hundreds and bees and butterflies joined the feast.

The boys cut the zebra across just above the lumbar vertebrae. They then cut off each hind leg at the socket joint. This left two legs and the large central portion. Front then cut up, legs taken off, and the neck cut off, and the chest split through the center. Each of the boys appropriated as much as he thought he could carry. A nearby tree of Brachystegia furnished an abundance of cord and the meat was bound into neat bundles.

But there lay the entrails, a mass of struggling life, and the boys had no intention of leaving them. Chogofola ripped open the big colon, Parugi cleaned the small intestines. There was not one shred of the zebra left. Every fragment cleaned up and taken. They show no repulsion at decayed meat nor at filth, in the sense that we do. One part seemed as good as another. They do not even sweep the maggots aside, but they do prefer entrails above all other meat.

When the meat was in camp it was cut up in strips 1-2 inches through and placed on a wooden frame and roasted over a slow fire every day for a week or more. When fully dried and hard it can be kept indefinitely.

Apparently meat is very hard to get and the boys are very jealous of every bit of it.

The rats which Raven got were all saved and one boy of our dompany, Parugi, saved the monkeys and baboons as well. Practically all of the birds were saved.

We were forced to move the boys' camp a little further from our own, to protect ourselves from the odor of decaying flesh.

The country about camp contained a large mopane flat from which I secured soil sample 21. Although called mopane flat, these flats have no trees on them except occasionally Combretum. Vegetation on hills is largely of Herb. 436, a large Brachystegia, that is used in every possible way by the natives, especially for fiber and cord. The hills, which are basaltic-like rock with many calcedony geodes in the bubbles of the parent rock, are well covered with small trees. The lower slopes are almost pure tall good growth of Brachystegia, while on the rich sloping soils Acacia robusta is prominent plant. Lower down the trees are clustered about the termite hills and consist of Combretum and m'swaswa, mumkonga, Euphorbia sansiveria, asparagus, etc., etc., with small orchid-like plants clustered under their protection. The river bank is covered with grasses and the slick clay land with Copaifera mopane. The most striking thing is the shallow root habit on the flats. Have seen very large roots three inches from the surface and 40 feet from the trunk. This is an open grass forest. Should be classed with open grass forest, although it is almost on grassland side of this division. Have seen nothing more beautiful than the view of the hills and valley back of Kafue. A few tall palms with swelling about half way up (Borassus) stand out, and below these luxuriant fresh green foliage recently expanded, of Acacia, Brachystegia, Combretum, etc. The mountains behind have a peculiarly transparent sky-line, showing the open spread-

ing character of the trees which cover them. Here is a wealth of fruits, grasses and plants of all kinds which should be useful to us. The grasses which I am most anxious to secure are just coming into flower and I can secure no seed.

Agriculture. Native agriculture consists of the scattered plantations of Kaffir corn, beans, pumpkin, tomato, etc., planted on anthills or on small alluvial pockets. Little or no attempt is made at continuous plantations.

White agriculture is largely a record of previous attempts with nothing growing at the present time. At the hotel are beautiful plants of mango and banana and no extensive plantings. Corn and tobacco seem to be the staple if anything is planted, while cotton has been tried. Here is a list of Mashakalumhave names of trees:

Mashakalumhave	Common.
Bukuzu	Wild fig. Edible.
Chikunku	Palm tree
Ibula	Large evergreen tree. Timber good. Edible fruit.
Ibugo	The baobab
Ihunga	Camel thorn
Indiondronga	Large tree growing on the river banks.
Injuma	Fruit eaten.
(Isompe (Mwalala	Grows on river bank. Fruit eaten.
Isuku.	Commercial wood. Fruit eaten.
Iwi	Wild orange
Kabangalulu	Forest tree, timber not eaten by borer insect. Medicinal use.
Kabombwe	Fruit used to poison fish.
Kalala	Palm tree (vegetable ivory). Outside of fruit edible
Mubanga	Hardwood untouched by borers. Forest tree.
Mubombo	Bark used by Mankoya tribe for making clothing and bags.
Mubumbu	Bark used for curing dysentery
Mudianswi	Borer-proof. Walking sticks made from it. Forest tree.
Mufupuma	Tree bearing violet-like flower. Root used for medicine for children to drink and wash in to make them grow.
Mufundi	Good bark, borer-proof. Forest tree.
Mufwebabachagi	Bark made into powder and smoked is said to have a fatal effect.
Muhubu	A wild willow
Mukaka	Bark used for string. Forest tree.
Mukololo	Tree used only by chiefs as firewood. Indicated good soil.
Mukomba	A flowering forest tree.

Mukunku	A palm tree. Fruit edible.
Mukushi	Stamping blocks and pestles made from it.
Mukutabulongo	Good firewood
Muleombezo	Borer-proof, good timber. Forest tree.
Mubombe	Light open timber, dark heart, good for native canoes.
Mulota	Used for medicine (see Mupapu)
Mulubululwa	Fruit eaten
Mululwe	Hard wood, not borer-proof, root used to cure leprosy and syphilis.
Kapukupuku	Large tree
Kalalasimba	A grass, cattle feed on it.
Inpobwa	Plant with pea-like flower, root eaten as vegetable
Mulumikumi	Scent of burning this scares away snakes. Light foliage.
Munkalankanga	Thorn tree
Muukonono	Dark heart, proof against borer.
Muntimbwe	Good for wattles. Forest tree
Munbo	White sticky sap used as glue. Leaves placed on the head cure headache
Munbokoshia	Fruit eaten, spoons and basins made from wood.
(Munbanbumba (Mumbolo	Hard wood, used for making drums
Mupagopago	Good fire wood, hard like mopane
Mupupu	Light fleshy leaves, white sap irritating to the eyes. People mix dry leaves with tobacco.
Mupusho	Useless
Musamba	Used for making string
Muse	Dark wood used for making spear shafts and walking sticks
Musekese	Indicates good soil
Mushibi	Fruit eaten. Stamping blocks made from timber.
Mushikivi	Evergreen
Mutaba (bubaba)	Sap used for bird lime. Fruit eaten
Mubanbwa (Ibonbwa)	Thick bark used for making bags
Mutembo	Good timber, used for medicine. Forest tree
Muteme	Large peach-like fruit, not eaten
Mutobo	Yellow flowers, fruit eaten
Mutondo	Axe shafts made from it. When it flowers boys know it is time to look for honey
(Mubuya (Mushiwe	Bark used for string
Muyu	Fruit eaten
Mughula	Root long and used for beating out grain
Mwangampand	Fleshy leaves similar to"mupupu"
Mwangula	Similar to "Musi", walking-sticks made from it.
Mwanga	Used as medicine for headache.
Mwangwa	Good workable timber, yellowish and hard.
Namabudi	Sap used as medicine for the itch.
Namugungula	The lily or sausage tree. Has large pod.
Shisbanbasokwe	Good mining timber, borer-proof.

The notes are by H. M. Vale, who has been some time with us in camp in Kafue.