

described as the Tian Shan fir, which is much like the *Wellingtonia* in appearance. That is very interesting, because this range described to-night is really much nearer to the Himalayan system, and it must be, as Mr. Skrine ventured to explain, that this curious characteristic is due to the fact that there is between the Himalayan and the Kungur range such an enormous wall of mountains as to prevent the interchange of flora. I think you will agree with me that what I said with regard to Mr. Skrine's photographs before he showed them to us was none too high praise. They do indeed constitute a most magnificent series of mountain photographs, and they show, above all, that Mr. Skrine himself took an immense amount of trouble in selecting the sites from which to take the different views. Mr. Skrine has also shown that, in spite of the fact that his early training in map-making consisted merely in plotting out a nine-hole golf course in the United Provinces, he must have proved an extraordinarily apt pupil, because the map which he showed us to-night, though it was compiled by a member of the Survey of India, was all based upon the excellent material which Mr. Skrine himself provided. And as long as Englishmen are prepared to spend such leisure as they are able to snatch from their ordinary daily duties in exploring the unknown places of the Earth in the way that Mr. Skrine has shown that he has done, so long, I think, will the English race remain pre-eminent as the pioneers of the world. May I express to Mr. Skrine the gratitude of this audience for the treat which he has given us to-night, and at the same time convey to him our hopes that in the course of the duties which may lie before him in the future he will find similar opportunities for exercising those talents which he has shown us he possesses in so eminent a degree.

UHA IN TANGANYIKA TERRITORY

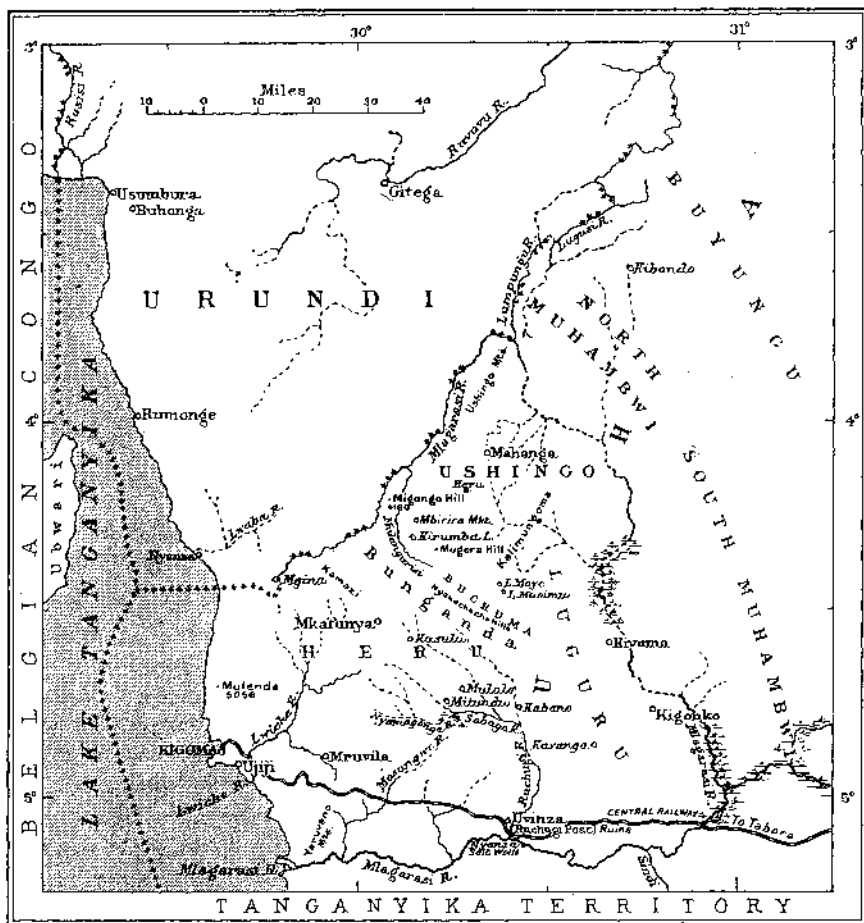
Capt. C. H. B. Grant

UHA lies approximately between 3° and 5° S. latitude and $29^{\circ} 40'$ and $31^{\circ} 15'$ E. longitude, to the north of the Central Railway line, within the administrative district of Kigoma. From 1921 to 1924 I was in charge of the Kasulu Sub-District, and for a time of Kibondo Sub-district also. These Sub-districts comprise Uha, the former being divided into three Sultanates, Heru, Ushingo, and Luguru, and the latter into two Sultanates, Buyungu and Muhambwi. The largest river is the Mlagarasi, which, starting from near Lake Tanganyika, goes northwards, and taking a bend south and west enters the lake some distance below Ujiji. All the waters of the Kasulu Sub-district, except for one basin that drains direct into the Lwiche, and of the southern part of Kibondo Sub-district, fall into the Mlagarasi. Kibondo Sub-district is badly watered compared to the Kasulu Sub-district. There the mountains of Heru are intersected with innumerable perennial streams and rivers of cool, clear crystal water, rising mainly in bare open grassland. These highlands were said to be covered in forest, the haunt of elephant, buffalo and other game, before the advent of the Watussi. Even during

such a dry spell as occurred in 1923, but 6 mm. of rain falling in June, July, and August, none of these rivers failed. Mr. W. Campbell Smith, M.C.M.A., Mineral Department of the British Museum of Natural History, is of opinion "that these rivers have their origin in springs which derive their water from distant sources, and that examination of the ground would probably explain the origin of the springs and show their relation to the large area of sedimentary rocks resting on Archaic rocks below." The pasture cannot be considered good, much of it being coarse grass; but during the drier months stock finds plenty of grazing in the evergreen valleys of the rivers and streams. Stock was undoubtedly introduced by the Watussi, and as regards Kasulu Sub-district is now confined to the mountains of Heru and Bunganda and to two restricted areas in Luguru. In earlier times the mountains of Ushingo and parts of the lowlands, as for instance Masengi, Mitundu, Mulalo, Sabaga, and Kalimungoma, were cattle districts, the cattle having died from rinderpest some time before European administration. The loss of stock caused the people to move, the one-time cattle areas becoming re-forested, and the tsetse has returned. The stock census of 1921 shows for Kasulu Sub-district 19,837 head of cattle, 3603 of which were bulls; sheep 4339, and goats 5079; but there is no doubt that stock was sadly depleted during the years of the Great War, and more especially the sheep and goats.

Sabaga is of peculiar interest; what was, within the memory of natives still living, an open grassy plain dotted with cattle, sheep, and goats is to-day a vast deep papyrus swamp full of hippo, sititunga, crocodile, wild-fowl, etc. The Nyamagonga flowed along its northern edge, and a small stream, the Kivogo, flowed somewhere through the centre from the south-west. Only the source remains of the Kivogo, and the Nyamagonga loses itself in this swamp to emerge at the eastern end as the Sabaga. Much of the papyrus on this swamp is floating, and the extent and position of the open water vary according to the wind. On the German map (C. 2) of 1 July 1906 a swamp is shown to the south of Sabaga by name Nyamiyonga, which to-day is merely a depression holding water only in the wet season. Natives can remember this as a permanent swamp, the home of hippo, sititunga, etc. In the Bunganda District of the Sultanate of Heru occur several lakes, the majority of which have no connection with any river, merely lying in wide open depressions, and served only by surface drainage. Several of these are very deep, notably Moye and Muzimu, a man getting completely out of his depth within a couple of yards of the bank, and would appear to be ancient craters. One of these lakes, Lake Kirumba, is shown on all maps as lying in the valley of the Mlagarasi. This is quite wrong, and has doubtless occurred through the similarity of two names, Mulangarisi and Mlagarasi, the former falling into the Mlagarasi near Migongo. The climate must be considered good; even the lower forested country is

by no means unhealthy, and the open grassy highlands which run to nearly 6000 feet above sea-level are as fine and bracing a stretch of mountainous



Sketch-map of Uha, Tanganyika Territory.

This sketch-map is based upon Captain C. H. B. Grant's detailed plane-table survey, which has been re-drawn on the scale of 1/300,000, and adjusted to fixed points of the Anglo-Belgian Boundary Survey by the Geographical Section of the General Staff, War Office. The map has not yet been published, but a photographic copy can be inspected in the Society's Map-Room.

The detail for the southern part, along the line of the Central Railway from Tabora to Kigoma has been taken from the map, based upon the plan compiled by the German railway contractors, which was published in the 'Geographical Journal' for November 1924.

country as exists anywhere in Africa, cool on the hottest days and cold with thick mists in the rainy season. The temperature is moderate, and for the twenty-six months from December 1921 to December 1923 averaged, maximum 29.1° C., and minimum 14.4° C., the rainfall for the same period and inclusive of a German record from April 1911 to March 1922 averaged 104.6 mm. The prevailing wind is from the east. Mineral specimens brought home have been very kindly identified by Mr. W. Campbell Smith as dark grey limestone from the Nyakachacha hills in Bunganda; quartz crystals from the mountains of Bunganda, presumably from veins intersecting the country rock; very compact grey dolomitic limestone showing deep solution furrows, chert stained red, and laterite from the hills along the eastern Malagarasi in Ushingo; pale lilac-coloured clayey sandstone from Kamazi in Heru; "diabase," agates from vesicles in diabase, calcareous deposits, pinkish-white clay, and pure white clay mineral like halloysite from the mountains of Heru; light red clay from the "salt licks" of the mountains of Ushingo.

Mr. Campbell Smith remarks: "As far as I can judge, the 'diabase' is probably intrusive in a sedimentary series of sandstones, clays, and limestones, which probably belong to what are known as the Tanganyika Beds. These have been described by F. Tornau, and are correlated by F. Behrend with the Black Reef and Pretoria Beds (Pochefstroom System) of the Transvaal, which is pre-Devonian. This series of sediments extends from just south of Malagarasi river almost as far north as Ruwenzori, and reaches eastwards from Tanganyika to the west shore of Victoria Nyanza."

With reference to the "salt licks," Mr. MacHinton suggests "that the salt carried in solution by percolating water crystallized out on the surface of the clayey cliffs, and that the beasts eat off the surface layer to get the salt. If this is so, the surface layer might be salt while within the mass of the clay there might be no trace. The problem really wants working out on the spot."* Erosive action is very apparent in the mountains, and is caused not only by the rivers and streams, but by the heavy rainfall washing away the surface soil.

The timber on the whole is small, though large trees are not uncommon. The "Marumba" (*Ficus*) is found only around the villages or their deserted sites, and provides the native with bark cloth, live fencing, rope, bags, and on the open highlands this tree and the Bamboo are the only firewood available for many miles. The "Misongati" (*Pandanus*) is found along nearly all the rivers, but is quite a useless timber for bridge work. Both the sweet-scented and non-scented *Mimosa* (*Acacia*) exist, the former in Southern Luguru. There is a wealth of flowering plants, among which the various-coloured *Gladioli*, the purple and white *Romulea*, and the *Gloriosa superba* are worthy of mention. Banks of fern are seen everywhere. Game is still quite plentiful, and the species found are the

* See also Christy, 'Big Game and Pygmies,' pp 217, 218.

elephant; black rhinoceros; hippopotamus; roan sable, which is confined to Southern Muhambwi; eland; topi and Lichtenstein's hartebeests, the latter not occurring in Kasulu Sub-district; Defassa waterbuck; buffalo; giraffe, which does not occur within Kasulu Sub-district; both forms of reedbuck; bushbuck; sititunga, a common animal in the papyrus swamps; zebra, which does not occur within Kasulu Sub-district; the common duikerbuck; and the warthog and bush pig. Only three kinds of francolin are found, three species of bustard, the helmeted guinea-fowl, two species of geese, and eight species of duck. The common and solitary snipe occur in great numbers during the summer season. Some species are the totems of certain families, and in consequence the meat is not eaten by them. The Watussi do not eat game, though they are not averse to hunting. Sultan Ruhinda of Ushingo and Mtwale Biessa of Bunganda are both keen hunters, but neither touch the meat. Elephant, rhinoceros, and hippopotamus are not eaten by the Waha, and very few will eat the flesh of the buffalo and bushbuck. The roan and reedbuck do not appear to be the totems of any families, and are therefore most generally hunted for their flesh. The totems of Sultans Kanyoni of Heru, Ruhinda of Ushingo, and Kimenye of Luguru is the Ground Hornbill (*Bucorvus cafer*), the "Ugugugu" in Kiba; that of Mtwale Biessa of Bunganda is the domestic dog; of Sultan Kahigi of Buyungu and Sultanness Nyamaliza of Muhambwi, the black ox. Elephant ivory, whether found or shot by a native, lion and leopard skins, and the Bateleur eagle (*Trochopius caudatus*) called "Nkona," captured alive or dead, are the perquisites of the sultans, who in the case of the ivory now send it to the Government.

Among the travellers who have visited Uha are Stanley, 1871 and 1876; Wissman, 1882; Baumann, 1892; Ramsay, 1896 and 1897; Rindermann, 1896; Burgt, 1896; Langheld, 1897; Fonck, 1898; Dautz, 1898; and Growert, 1898. Stanley in November 1871, on his way to Ujiji, endeavoured to cross the southern part of Uha, reaching Kabano in Luguru; but owing to the heavy tribute demanded by the chiefs he crossed the Ruchugi and made for Ujiji by way of the forests of Uvinza, not daring to light fires or shoot game until he was clear of Uha lest the chiefs should follow him. In 1876 on his travels from Lake Victoria to Ujiji he kept to the eastward of Uha, and on his map is the note "heavy tribute demanded by kings and chiefs of Uh-a." Stanley therefore saw little of the country, and incorrectly gave the name "Uguru" to the mountains of Heru. Baumann, who crossed northern Ushingo on his way from Urundi to Tabora in 1892, says of the Waha, "They are governed by petty chiefs, and live in small villages." It would therefore appear that he did not meet the Sultan of Ushingo, though his latter statement holds good to-day. I am unable to find that any of the other travellers, all Germans, have left any record of their impressions of the people and country.

Broad roads opened by the Germans, Belgians, and British, with timber bridges, make travelling easy throughout the greater part of the year, though they are in no sense fitted for motor traffic. At Kasulu village a stone bridge crosses the Bogwi. In 1923 a new road was cut from Kasulu to Kigoma round the foot of the mountains, and Commander Kerr reached Kasulu Boma by motor cycle in October of that year in a few hours' riding. This was the first time a motor vehicle had entered Uha. Considerable work has also been carried out on the roads in Kibondo Sub-district, and there appears no reason why the road from Kasulu Boma to Kibondo Boma and thence to Bukoba should not be able to carry light motor transport during the greater part of the year.

The population of Kasulu Sub-district in the census of 1921 was 77,400, and about 130,000 for the two Sub-districts.

The Sultanates are divided into districts under sub-chiefs called Watwale and Wateko. The Sultans are called Mwami, and are all related, being the descendants of the Watussi who came from Ruanda many generations ago. Two tales are told as to how the Watussi reached Uha. One is that, rinderpest having decimated the cattle, they came south hunting elephant, and carried back the ivory to purchase fresh stock from a country farther to the north, probably Uganda and Kenya, and afterwards returned and settled in Uha. The other is that two brothers, Nkanza and Kimenye, quarrelled with their father, and hearing that to the south there was a country without sultans, travelled thence, and settled in Buyungu, Kimenye afterwards moving further south into Kunkanda (the ancient name for Luguru). It seems certain that Nkanza was the forbear of the sultans of Kibondo Sub-district, and Kimenye the forbear of the sultans of Kasulu Sub-district, as both these names appear first in the genealogical trees. There is no doubt that the immigration of the Watussi into Uha was a peaceful one, and they were almost immediately looked up to by the Waha, who accepted them as their super chiefs. Previous to the influx of the Watussi it would appear that the Waha were a purely agricultural race, and that their chiefs were the present Watek, who were more village headmen than chiefs of districts, the Mtwaliat being an innovation of the Watussi, and even to-day many of the more powerful Watwale are Watussi, and several are closely related to the reigning families. The Wateko still have great influence over the people, and have very considerable power. In them is vested the planting and grazing rights, and they are the blood brothers of the Nsatu (python).

In the beginning, Heru, Ushingo, and Luguru were under one sultan, but this did not last long, as the sons who were the Watwale of these districts declared themselves as independent sultans after Sultan Ntale had lost the war against Bigondo of Luguru, and returned to Heru sick, to die soon afterwards. On the defeat and death of Ntale, Ruhinda of Ushingo declared himself an independent sultan, as did Bigondo, who

styled himself Luasa the First of Kunganda (Luguru). After the partition of Kasulu Sub-district into three sultanates, peace appears to have reigned throughout Heru and Ushingo up to the taking over of Uha by the German administration, but in Luguru trouble arose between Sultān Kasuwa (who died in 1921) and his brother Tuki through the machinations of one Tagazwa, a powerful Mtwale, still alive, and relation of the reigning family, who had put Tukin in as sultan and caused Kasuwa to flee to South Muhambwi. Finally the German Government intervened on behalf of Kasuwa, and established a seat of administration at Ujiji. When in March 1921 the British took over Kigoma District from the Belgians, Heru was in a ferment owing to the usurpation of the sultanate by Luyagwa, who was not the lawful sultan. Makwaya (Kanyoni), the rightful heir, was placed in power, and by the end of 1921 comparative peace had been established, to be broken twice during 1922 by faction fights, the final sparks of the unrest caused by the war between the Great Powers.

The Watussi are a tall thin people with Semitic features and square shoulders, but those resident in Uha are not so tall as the Watussi of Urundi. They usually marry only into Watussi families, though natives of mixed blood are not uncommon. Some of the sultans and Watwale have personal bands which are called "Busego." The Waha are an independent, cheerful people, much given to conviviality, dancing, and beer-drinking, this latter often leading to personal quarrels and fights; and most cases of murder are done during a state of intoxication and in the heat of the moment. Civilization has touched the people but little, and both Watussi and Waha are very much as they were before the white man first visited Uha. The Missions have had no real influence on them, and very few indeed have turned to Mahommedanism. They still dress as of old, and have little or no need of money, their country producing their clothes, their houses, and their food. Their dress is usually of bark or hide, with copper or brass bangles. Every man carries a spear, and generally a knobkerrie and knife. Bows and arrows are carried only when hunting and at war. In North Muhambwi poisoned arrows are used. Cloth is received in barter, but is worn in exactly the same way as the native-made skin and bark dresses.

Their houses are of the beehive type; some are merely poles set up in an inverted sugar-loaf, and roughly covered with grass; others, especially of the Watussi, are well made and roomy, having the grass laid on in a ridge-pattern over a bamboo frame. The villages are usually surrounded by a "Boma" of "Narumba" and reeds. In the forested areas strong bomas of stout timber are erected as a protection against lions and leopards. The larger villages are divided in compounds within the main "Boma," one being for stock.

Both men and women cultivate the fields and plantations, and the younger people herd the stock. All land is communal, and the individual

only holds a garden or plantation as long as he remains there to cultivate it. As cultivators the Waha are good, tilling the ground deep, and reaping rich crops of mtama, maize, beans, pumpkins, sweet potatoes, tobacco, etc. In the mountains water furrows are to be seen along many of the valleys, and by this means green crops are available throughout the year. The cutting of these furrows has entailed considerable work, and is carried out by the families residing in any particular valley, an amicable arrangement being arrived at as to the use of the water to irrigate each garden. A new-comer pays for the right of tapping the water-race for irrigation purposes, the payment varying according to the amount of work originally carried out on the construction. Rice, European potatoes, and vegetables do well, and wheat and cotton have been experimented with. Many of the river valleys would stand extensive cultivation, as for instance the Mugandazi, parts of the Ruchugi, and that part of the Mlagarasi lying between Muhalulu Mountain and Migongo. The possibilities of Kasulu Sub-district, both from an agricultural and stock point of view, are very great, and it is to be hoped that the Waha will realize the enormous potentialities of the country in which they live.

The industries of Uha, apart from agriculture and stock-raising, are the winning of salt from the surface near the eastern reaches of the Mlagarasi bend, and in the great salt swamp on the eastern side of Kibondo Sub-district; and from the "Ebeberi" grass, which is first burnt and the salt extracted from the ashes; the making of pots, jars, cooking-utensils, etc., from local clay; wooden stools; basketwork of palm and grass; beadwork; copper and brass wristlets and wire bangles and anklets; whistles from hippopotamus ivory; drums; bellows for smelting; bark cloth and bags from the "Marumba"; wearing apparel and purses from hide; salt-carriers from the leaves of the "Mulembera" tree, which are ingeniously woven by bending over the stalk of each leaf, and are sold in large quantities to the Nyanza saltworks; iron smelting and the manufacture of iron implements and articles, as hoes, axes, bill-hooks, knives, spears, arrow-heads, and bells for dancing. Iron is plentiful throughout Uha in certain localities, and old surface workings are frequently seen. The iron is extracted from the ore with the aid of charcoal and native bellows.

In the Sultanate of Heru there are thirty local markets, purely native, where the people buy and sell local produce to each other, such as grain, beans, meat, and bananas, and native-made articles as bark cloth, wire bangles, and iron hoes. Salt from the salt-wells of Nyanza in Uvinza and from surface winning near the bend of the Mlagarasi finds ready purchasers both among the local population and the Warundi, who cross the border to trade. These markets are a very ancient institution, and are free from Government tax, though in some a tribute is paid to the local chief. They do not exist in the Sultanate of

Ushingo and Luguru. Permission to establish a new market is given by the chief, and the place is "blessed" by a native doctor, who buries an offering in the centre of the ground. Later a Marumba tree is often planted on the spot. Numbers of Warundi visit Mbirira market daily to sell hides, cow and palm fat to the Indian and Arab traders, receiving either cash or cloth in exchange. This market and Kasulu are the only two where Indian and Arab shops are found; but whereas the traders of the former depend almost entirely on the hide and fat trade, the traders of the latter do a general store business. In these two villages are also to be found a number of alien natives, who style themselves Swahili; as a matter of fact hardly one is a man of the coast, nearly all being Congo natives. These Congo natives have in most cases arrived in Uha through the Arab slave-raiders. As elsewhere in Tanganyika territory, a certain amount of domestic slavery exists, but it is not very apparent. This domestic slavery was augmented during the famine in northern Ushingo about seven years ago, the people selling their children for a handful of food.

A sultan is never allowed to die, nor is he buried in the ground. When in extremis, he is either strangled or his neck twisted by whosoever is present at the moment. Pandemonium reigns in the village at the death, and every one flees, driving away all beasts and seizing any article they can lay hands on. The Bilu (who are said to be the children of certain slave women) alone remain and take charge of the body, and seize all stock, etc., left behind. A white cow is killed and the skin removed entire, the horns being detached from the skin. The body is placed in this skin with the head in the head of the skin, and the arms and legs in the four legs of the skin. The skin is sewn up, and the whole is dried over fires which are fed with milk. When dry, the body is placed in a canoe-shaped wooden trough, the whole sewed up in a cowhide, and carried to the burial-place of the sultans, and is there placed on trestles, and a hut built over it. On the road from the village to the burial-place all stock passed is captured by the Bilu, therefore the people make themselves scarce on these occasions. When all is over, the chiefs and people return to the village and a new sultan is appointed. The Bilu and the attendants of the burial-place called "Banyongozi" are taboo to the Sultan, who is never allowed to meet them, nor does he ever visit or look upon the place of burial. The sultans of Heru are buried at Kisangi in the Highlands, those of Ushingo are buried at a place of the same name situated on the north-western slopes of Kihinga, and the sultans of Luguru are buried at Mumisanzu, a little way to the north of Kivumba.

The burial-place of the sultans conjures up the "Valley of the Kings" in Egypt, but nothing so ornate and elaborate is to be seen. A more wretched arrangement for the keeping of the bodies cannot be imagined. In the middle of a clump of "Marumba" is found an ill-kept native hut or sq. In the hut with the coffin live the attendants. On

one side of the hut is seen the coffin on its trestles, and beneath it the offering to the spirits of the dead. Both the coffin and the inside of the hut is black from the smoke of fires. At Kisangi in Heru only the coffins of Mtale IV. and of Luasa are to be seen; the coffins and huts of the other sultans have long since entirely disappeared, the coffin of Mtale IV. has already fallen to one side, and was leaning against the side of the hut, an example of how completely the Central African native leaves no sign of his existence. The peculiar rites described above are carried out for the sultans only; all other Watussi are buried in the ordinary way within the village.

A newly appointed Mtwale pays for this honour in cattle, from two to five to the Sultan, one to the Sultan's representative, who formally hands over the district, and one or more to be killed and the meat given to the people. Likewise a new Sub-Mtwale pays the Mtwale. The people build the huts of their chiefs, and cultivate the fields of the Sultan. On completion the people receive presents of meat and salt. Though no tribute is demanded by the sultans and chiefs, they accept food-stuffs in the form of presents. Under tribal system the sultans and chiefs hold public courts for the hearing of cases affecting the ordinary life of the people, and fees are paid by the parties. A plaintiff usually opens proceedings by taking a pot of native beer to the chief, and fees are standardized to the value of 3s. or 4s. for a stock case, a proportion going to the chief hearing the case, and to the man who calls the defendant and the witnesses. Garden or plantation cases are 1s. and 2s., and are heard by the Mteko or the Mtwale. The Sultan's Court stands as a "Court of Appeal" if either party disagrees with the judgment given. Should it come to the ears of the court that witnesses have been bought or bribed, the court refuses to hear those witnesses. This system will, however, go, now that the Government has established properly constituted native courts. The spear also plays a part in native law, as when the plaintiff wins his case but only receives part of the claim, he places his spear in the ground before the court and people, or he will go to the place of a debtor and place his spear in the ground before his hut, gardens, or stock. Sometimes the plaintiff hands money to the elders attending the court, or gives each a specially cut stick. This custom is obviously to impress the matter on the minds of the assembly. In the settlement of dowry or debt, a milk cow is equal to two bulls, and *vice versa*. The killing of an elephant or the finding of ivory entails the rite of a sheep or goat being killed over the carcase, and a pot of honey being placed near it. After the lapse of a few days the tusks are removed and taken to the Sultan, to whom they are taboo until this rite has been carried out. In all villages and in certain sacred woods the "Mwiko" or spirits are propitiated by the placing of food and the erection of miniature huts.

In the district of Buchumu in Bunganda, near the headquarters of the Karengi, there exists a pool within a wood called Kikorogwi, the waters of

which are said to be poison to the Watussi and animals, but which is not harmful to Waha. Skeletons of reedbuck and warthog are said to be seen around it, and it is taboo to all. Any person drawing water is liable to be accused of attempting to poison his chief or Mtussi. When any one approaches the tree shakes as in a high wind, snakes appear, and a drum booms in the depths of the pool. Only one white man, a German, has been within this wood, and he fell dead when he struck a tree to fell it with an axe! At least, so the natives say, but they will not point out the exact place to any European. On the top of Mugeru Hill, at the southern end of the low range that marches with the eastern Mlagarasi river, is a solitary tree, and it is said that every beehive placed in it is always found on the ground next morning. Sometimes the ropes are left up the tree quite intact, and sometimes ropes and all come down, but are unbroken and uncut!

On the top of Ngoro in the Ushingo Mountains, at a spot where two footpaths meet, three pieces of a stone ring are to be seen. Natives passing the place pluck grass and arrange it carefully around these pieces. They say that originally the ring was whole, and that in a wood close by there exists a stone hammer and other tools of the "mythical" workman. During some part of the year a very large male rhinoceros keeps guard over the ring and drives away any one approaching! Before European Administration and Ordinances replaced some of the tribal laws, the crime of homicide could be punished by the Sultan seizing all the property of the murderer, though none of this property was paid to the family of the murdered person. But more often the murderer paid blood money. The non-payment of blood money more frequently led to vendettas. Robbers and thieves received no quarter when caught red-handed, and were hunted down and killed, the right hand being removed from the body and carried to the Sultan on the point of a spear, the body being left to be eaten by hyenas if the relatives did not bury it. This practice is hard to eradicate, and in 1921 a robber's hand was brought in to Kasulu Boma on a spear-head, the body of the robber being severely battered and covered in spear wounds.

Kihugu is the kingdom, and Kimana God. Some say Kimana is the python, and others a force felt but invisible. Opinion is divided on this point, though to all the python is sacred, and is under the special guardianship of the Mteko, and his attendant satellite, the Maholia or Sabukuru, who helps the Mteko in the apportioning of gardens, etc., to the people. Should an Mteko accidentally kill a python, he gives a present to the Sabukuru, who makes medicine and cleanses the Mteko's person and house. No Muha will voluntarily kill a python. Should he do so accidentally, he instantly reports the matter to his Mteko, taking with him a present, half of which the Mteko gives to the Sabukuru, who then carries out the cleansing process. Witchcraft is largely practised, resulting in false and imaginary evidence being produced before the

courts, adding not a little to the magistrate's ever-present difficulty of sifting the lies from the truth.

I have made a plane-table survey based on points fixed from the Central Railway by Mr. F. Longland, who took the German Railway Map of 1913 as being accurate. The Geographical Section of the War Office, who are very kindly reproducing the map, report that very little adjustment is necessary to correlate the work to the positions recently fixed by the Anglo-Belgian Boundary Commission. The latitudes given on the German map were found to be accurate, though the position of Kinama was found to be too far west. Kinama was the name of a deceased Mtwale, and has therefore been omitted from the map. Luasa, so prominently marked on all published maps, is the name of a deceased Sultan of Heru.

GEOTHERMIC RESEARCHES MADE AT BORYSLAW

Henryk Arctowski

AFTER several unsuccessful attempts to obtain accurate temperature data at various depths in oil-wells, I have finally adopted a device which is practical and simple. A weight of 1 kilogram lowers a thin steel wire, to which thermometers are attached, and a wheel of 1 metre circumference, fixed on a demountable tripod about 2 metres above the ground, measures the length of wire lowered. For depths of 400 metres or more I use small maximum thermometers of a special construction and an appropriate very short scale. Three such thermometers bound together are sealed in a glass tube. This tube is protected by three springs, slightly bent and fixed at both ends to small aluminium blocks, cut in two lengthwise so that they may be screwed tight to the wire.

The tube containing the thermometers is attached separately to the wire in order that the reading may be promptly made at the moment of the return of the thermometers to the surface. This is necessary because the temperature of the air, during the summer months, is frequently higher than the temperature measured at moderate depths. The thermometers must be cooled again before being lowered.

For small depths, to 400 metres, I also use ordinary thermometers of large dimensions, sealed in thick glass tubes and protected against changes of temperature. These thermometers require several hours' exposure, and are therefore generally left in the well overnight.

When the measurements are made at a greater depth than 1000 metres not more than four sets of thermometers are attached to the wire, while for lesser depths as many as seven measurements may be made in one operation.

With the help of two of my assistants, Stanislaw Zych and Henryk Orkisz, I have already made 824 measurements in 33 wells at Boryslaw, Tustanowice, and Mraźnica.