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ROYAL BOTANIC GARDENS, KEW

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LII.—NORTH-EASTERN BRITISH SOMALILAND.

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In June, 1929, the Secretary of State for the Colonies informed me that arrangements were being made for the demarcation of the boundary between British Somaliland and Italian Somaliland. Mr. Amery very kindly sent me this information, as it had been suggested to him that I might wish to consider the possibility of sending a qualified botanist from Kew to accompany the Commission.

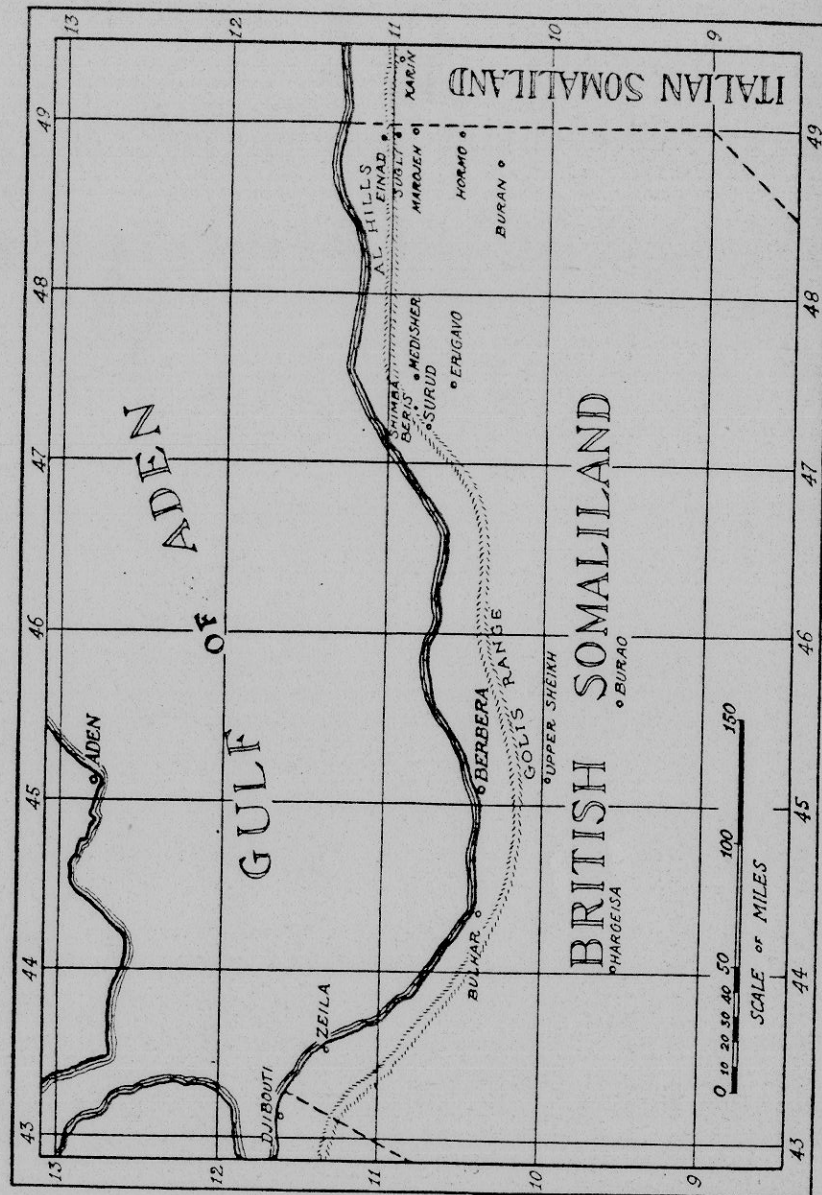
I was very glad to avail myself of this interesting opportunity and was fortunate in being able to secure the services of Mr. C. L. Collenette for the purpose. Mr. Collenette accompanied the Commission during part of their stay in Somaliland, making extensive botanical collections. Unfortunately, he was prevented by an attack of blackwater-fever from staying in the country for the whole of the period with the Commission, but it was very fortunate that he was not taken ill until after the most interesting portion of the Boundary, from the botanical point of view, had been thoroughly investigated.

The expenses incurred in attaching Mr. Collenette to the Commission were met from the funds placed at my disposal by the Empire Marketing Board for the purpose of making botanical collections, and the following paper by Mr. Collenette gives an account of his botanical observations of the region visited, from various points of view. A detailed account of the plants collected will, it is hoped, be published in an early number of the *Kew Bulletin*.

A. W. H.

The Commission assembled at Berbera in the second week of August, 1929, and a fortnight was spent in landing and repacking stores, which were despatched by camel train for the boundary. On the 29th August a start was made by motor lorry for Buran (lat. $10^{\circ} 13' N.$, long. $48^{\circ} 47' E.$), 3000 ft., 15 miles from the boundary, chosen as the advanced base on account of its accessibility and excellent water supply.

It was now the end of the dry summer season, and locusts in very large numbers were encountered throughout the journey. Vegetation was in consequence practically without flower or leaf, but *Euryops Hildebrandtii* Mattf. and the very common *Justicia Phillipseae* Rendle were untouched by the insects.



The route from Berbera led southwards over the coastal plain, known as the Guban, to the Golis Range, where the Sheikh Pass winds steeply into the hills to Upper Sheikh, the hill station of the Government, at 5500 ft.; thence south-eastwards to Burao (lat. $9^{\circ} 32' N.$, long. $45^{\circ} 33' E.$), a station of the Somaliland Camel Corps, and north-eastwards to Erigavo (lat. $10^{\circ} 37' N.$, long. $47^{\circ} 23' E.$), where at 5700 ft. is a small station with a Commissioner. The vegetable garden of this station, situated at Medisheh, in a rocky valley with permanent water, some 27 miles by road from Erigavo, had been completely laid bare by locusts, even the stalks of vegetables having been eaten down. Of wild plants, the leaves of *Salvia somalensis* Vatke and *Lasiocorys argyrophylla* Vatke were left untouched, but the flowers were eaten.

From Erigavo the route lay eastwards for 105 miles over level stony country to Buran.

I remained with the Commission from 5th September, 1929, to the 10th February, 1930, during which time the surveyors completed the work on the boundary from Buran (lat. $10^{\circ} 13' N.$, long. $48^{\circ} 47' E.$) northwards to the sea. After this the Commission worked southwards, but the level and monotonous nature of the country, and the fact that no rain could be expected for some weeks, did not justify a continuance of the botanical work.

At the time of the arrival at Buran, locusts were most luckily on the decrease, and shortly afterwards were seen no more, with the exception of one large swarm, which passed over without settling, on 23rd September. Rains had also commenced, and during the month of September totalled between half an inch and one inch, which quickly brought the vegetation into flower.

During the first six weeks of the period, the district round Buran was thoroughly explored for plants, about 140 species being found in flower. The Commission then moved 23 miles to the northward, where at Hormo, 2250 ft., in a different type of country, a further 30 species were collected. From Hormo, a trip was made to the north-east into Italian Somaliland, with a short stay at Karin (lat. $10^{\circ} 57' N.$, long. $49^{\circ} 24' E.$), in the foothills of the coastal range at 900 ft. Here the rainfall had been poor, but permanent water, both in the form of springs and beneath the surface, encouraged local vegetation, and the trip yielded 36 additional species.

From 4th to 30th November I was able to pay a visit to the Al Hills near the coast, collecting at various altitudes, and camping near the summit of the range for 17 days at Sugli, 4750 ft. (lat. $10^{\circ} 58' N.$, long. $48^{\circ} 53' E.$). This country was most interesting, and 134 species not previously seen in flower were collected.

From 12th to 28th December a further camping trip was made to the Surud, in the coastal range about 120 miles to the west of Buran, where the elevation reaches 7250 ft., the highest ground in Eastern Somaliland. Here camp was made for a fortnight at

Shimba Beris, 6750 ft., and 58 further species were added to the collection.

During the month of January, 1930, the flowering season by this time being practically over, seeds and roots of a number of species were collected in the Buran district, and additional notes obtained from the natives.

Eastern Somaliland may be divided into three units:—

- (1) A flat and narrow coastal plain, backed by hilly and broken country which extends to the precipitous northern slopes of
- (2) The Al Hills, running roughly parallel to the coast, which attain a height of from 4000 to 7250 ft. and stretch across northern Somaliland, under various names.
- (3) The inland plateau, mainly at an elevation of 2000 to 3500 ft.

The climate is governed by the North-east monsoon, which blows from November to March, and the South-west monsoon, which blows from May to August or September. The strongly desiccating nature of the latter causes all vegetation to dry up.

Rainfall varies considerably from year to year and in different parts of the country. On the coastal plain it is very slight, ranging from 1 to 5 inches in the year. On the higher northern slopes of the Al Hills there is much mist and cloud, and precipitations probably amount to as much as 30 inches. At Erigavo, on the southern slope of the range at 5700 ft., the recorded rainfall has totalled $10\frac{1}{2}$ to $15\frac{1}{2}$ inches in the year, mainly in the months of April-June and August-September. On the inland plateau precipitation usually takes the form of local storms, and some districts may be completely missed. An estimate based on the few available data gives a figure for this region of from 5 to 10 inches annually.

Immediately after a few showers an ephemeral vegetation springs up, while trees and bushes come into flower. The flowering seasons are short and irregular, but on the inland plateau are principally confined to the months May-June and September-October.

Temperatures are high: published figures for the coastal belt (Berbera) show a mean maximum for the year of $93.1^{\circ} F.$ and a mean minimum of $74.3^{\circ} F.$ The highest figures occur during June to August and the lowest from November to February. At 7000 ft. on the coastal range (Shimba Beris) for eleven days in December 1929, the mean maximum was $76\frac{1}{2}^{\circ} F.$ and the mean minimum $37^{\circ} F.$ On the night of December 26th-27th, $31\frac{1}{2}^{\circ} F.$ was recorded. At Erigavo (5700 ft.), the recorded temperatures for 1928 and 1929 give a mean maximum of $78-79^{\circ} F.$ and a mean minimum of $49-51^{\circ} F.$; temperatures below freezing point occurred in the month of January.

On the inland plateau, temperatures are lower than on the coast, and show a greater range; at Buran (3000 ft.), the mean maxima during September, October, December 1929 and January 1930 were 94° , 93° , 85° and $81^{\circ} F.$, and the mean minima 70° , 69° , 64° and $59^{\circ} F.$

The soil of the inland plateau is mainly a reddish sandy clay, giving a slightly alkaline reaction. Limestone outcrops are frequent, and rocky areas occur with little soil. The Al Hills are of limestone, steeply precipitous on their northern face and sloping more gently to the south, this side being much split up into valleys.

Biotic factors. The inhabitants are divided into tribes, which lead an entirely pastoral existence, and move in the wake of the rainfall. On the inland plateau, domestic animals (camels, sheep, and goats) undoubtedly affect the composition of the vegetation in the principal grazing areas, where edible species lead a much more precarious existence than those which are protected or poisonous. Moreover, in time of drought, natives have a practice of cutting and bending over the stem of *Acacia* and other bushes to allow the animals to graze on the upper branches. This is an offence under the laws of the Protectorate, but it has been recently and extensively practised in some districts.

The effect of domestic animals on the vegetation has been varied in the past by the fluctuation in their numbers, owing to the unsettled condition of the country. Although periodic drought is a controlling factor, under present conditions there would seem to be room for a considerable increase in flocks and herds, with a correspondingly augmented influence on the vegetation.

The wild fauna of the country is insufficient in numbers and size materially to affect the vegetation.

Somaliland is subject to periodic visits of the locust *Schistocerca gregaria*, one such period, lasting for over a year, having occurred just prior to the visit of the Commission. Although no dead vegetation was noticed as a result of their attacks, it was estimated that after the autumn rains of 1929, in the Buran district, only some 25 per cent. of individual woody plants came into flower, due largely to defoliation in the previous season and the eating out of dormant buds. A breeding area of the locusts occurs in the foothills between the Al Hills and the sea, where several swarms of "hoppers" were seen in the autumn of 1929.

The extensive forests of *Juniperus procera* Hochst., between 6000 and 7250 ft. on the coastal range, are subject to damage by fire, as the trees grow thickly together and there is much dead timber. Large open areas at this elevation, covered with low-growing vegetation and without junipers, may have been cleared in this manner in the past, but no traces of recent fire could be found. A fire started by natives during the fighting against the Mullah is said to have covered a considerable area, but this district was not visited.

The two frankincense trees, *Boswellia Frereana* Birdwood and *Boswellia Carteri* Birdwood, are extensively exploited for their gum by the natives who live in the hills. The trees are protected from harm and are never cut as firewood, and are left untapped until they attain considerable size. No attempt, however, is made to increase the number of trees.

In the area of North-eastern Somaliland under review *Acacia* gums are collected to some slight extent, but not on a commercial scale.

CLIMATIC VEGETATION.

The coastal plain, a narrow strip a few miles wide between the sea and the hills, with very low rainfall, and subject to continual sand-storms during the south-west monsoon, has a very sparse vegetation. No specimens were collected from this area, which contains, sometimes half-buried in drifted sand, isolated and stunted *Acacia* bushes, such as *Acacia misera* Vatke and *Acacia spirocarpa* Hochst. On the sea shore are extensive beds of *Suaeda fruticosa* Forsk., with frequent bushes of *Tamarix nilotica* Ehrenb.

The inland plateau, elevation mainly from 2000 to 3500 ft., includes the whole of the north-eastern side of the country south of the coastal range, and consists of level tracts, the surface often covered with loose stones, and occasional low limestone hills, with small outcrops of gypsum. Stream beds or "tugs" occur, trending west to east, which contain water for only a few hours after storms. The vegetation of the plateau may be divided into two types:—

(1) That of the limestone rocky soil, of which the Buran district (lat. 10° 13' N., long. 48° 47' E.), 3000 ft., may be taken as an example. This locality has a rocky or stony surface, rather sparsely covered with bushes and small trees, and presenting even after rain a grey-green and rather lifeless appearance. Permanent water occurs infrequently, in rocky pools. The plants typical of this association are:—

Chenopodiaceae, not determined. Very abundant, but avoiding the "tug" beds, native name "Waloh."

Balanites orbicularis Spr.

Acacia misera Vatke.

Acacia spirocarpa Hochst.

Acacia Bussei Harms.

Acacia mellifera Benth.

Zygophyllum Hildebrandtii Engelm. Abundant. Leaves bright green.

Sarcostemma viminalis R. Br.

Aloe percrassa Tod.

Schizachyrium Kellerei Stapf.

Large conspicuous grass clumps, not really abundant.

Eleusine Robecchii Chiov. A very common grass, avoiding "tug" beds.

Tamarix nilotica Ehrenb. Confined to the "tug" beds.

(2) That of the sandy soil, of which the Hormo district (lat. 10° 33' N., long. 48° 59' E.), 2250 ft., is an example. Bare rock seldom appears. Water occurs as shallow pools in the "tug" beds, and is rarely permanent on the surface.

Vegetation is fairly heavy along the lines of the "tugs" but more sparse on the level ground. Grass appears extensively, and often affords good grazing.

The dominant plants are:—

Acacia spirocarpa Hochst. The only common tree, largely confined to the neighbourhood of the "tugs."

Zizyphus Hamur Engl. Abundant, usually near the "tugs."

Tamarix nilotica Ehrenb. Rather numerous in the "tugs," often dwarfed.

Amphilophis radicans Stapf. } Often covering the ground over
Pennisetum orientale Rich. } considerable areas, not dependent
on the "tugs."

Cadaba mirabilis Gilg. Over the whole area, not especially numerous, but green and conspicuous.

Calotropis procera R. Br. Locally common in the "tugs," absent in some localities.

The sandy soil vegetation occupies a far larger area on the inland plateau than that of the rocky areas, but the two often intermingle, and it is perhaps better to take a combination of the two as representing the whole of the country near the boundary from lat. $10^{\circ} 10' N.$ to $10^{\circ} 50' N.$ This may be compared with the trans-African belt of "thorn scrub."

Valleys and lower slopes of the Al Hills (coastal range). The north-east monsoon coming in from the sea impinges on the northern slopes of the range, resulting in considerable rainfall and cloud. On the more gently sloping southern side, heated by the sun, the rainfall very rapidly diminishes, and the lower slopes are reached only by occasional storms, although clouds are more frequent than on the level plateau southward.

The southern foothills of the range are intersected by valleys with rocky and stony floors, sheltered somewhat by the surrounding slopes. These valleys support a considerable vegetation, and that at Marojeh (lat. $10^{\circ} 54' N.$, long. $48^{\circ} 59' E.$), 2250 ft., may be taken as typical. The dominant plants are:—

Croton confertus Baker; *Bridelia somalensis* Hutch., sp. nov. (see page 413); *Maerua sessiliflora* Gilg; *Grewia villosa* Willd.; *Balanites aegyptiaca* Del.; *Acacia spirocarpa* Hochst.; *Zizyphus Hamur* Engl.; *Zygophyllum Hildebrandtii* Engl.; *Aerva persica* Merrill (*A. tomentosa* Forsk.).

On the steep slopes which fringe many of the southern valleys up to 3500 ft., the sparse flora is largely composed of the frankincense tree, *Boswellia Frereana* Birdwood, which yields the "Maidi" gum. This tree grows from cracks or pockets in the rock, and prefers a steeply sloping surface. It is not as a rule to be found on more level ground, although it is certainly not crowded out by competition; it is not often seen above 3750 ft.

From the plains and upwards to about 3750 ft., the more gentle and rounded slopes, not occupied by the *Boswellia*, have a sparse flora composed largely of:—

Balanites aegyptiaca Del.; *Acacia spirocarpa* Hochst.; *Eleusine Robecchii* Chiov.

The lower slopes on the northern side of the range are subject to a much greater rainfall than the southern side, and at 1000 to 1500 ft. the plants of the maritime plain give place to a more prolific vegetation, which again merges at about 3000 ft. into a mountain zone, to be referred to later. The dominants in this intermediate area, noted at Einad (lat. $11^{\circ} 02' N.$, long. $48^{\circ} 55' E.$), 2000 ft., are:—

Commiphora sp. (not in flower or fruit), native name *Gadon*; *Dracaena schizantha* Baker; *Commiphora erythraea* Engl.; *Boswellia Carteri* Birdwood; *Euphorbia noxia* Pax.

Herbaceous plants are not numerous and there is little grass.

The mountain zones. On the southern side of the range, the zone from 3750 ft. to the top of the slope at 5000 to 6250 ft. is characterized by a growth largely composed of succulents. The soil is sparse, and the radiation of the sun's rays from the surface intense, but night temperatures are cool. The dominant plants are:—

Euphorbia sp. (not in flower or fruit), native name *Angir*.

Trematosperma cordatum Urban.

Euphorbia nigrispina N. E. Br.

Euphorbia sp. (not in flower or fruit), native name *Dibu*.

Buxus Hildebrandtii Baill.

The highest zone on the Al Hills is marked by an abrupt division from the last mentioned, commencing at the top of the southern slope. It stretches across the broad summit of the range at heights varying from 4000 to 6250 ft., and down the northern slope to about 3000 ft. It occupies the site of greatest rainfall, and throughout much of the year is sheltered by clouds. Other factors are the more oblique rays of the sun on the northern slopes, and the lower temperature due to elevation.

Buxus Hildebrandtii Baill. clothes this area in almost unbroken cover, and makes up perhaps 90 per cent. of the larger vegetation. In its shade, and growing in the deep humus derived from its fallen leaves, is a carpet of small and delicate herbaceous plants and ferns of numerous species. The dominants in this area, noted at Sugli (lat. $10^{\circ} 58' N.$, long. $48^{\circ} 53' E.$), 4750 ft., are:—

Buxus Hildebrandtii Baill.

Acokanthera Schimperii Schweinf.

Cadia purpurea Ait. (*C. varia* l'Hérit.).

Euphorbia sp. (not in flower or fruit), native name *Dibu*.

Acacia sp. (not in flower or fruit), native name *Sug-sug*.

Euphorbia sp. (not in flower or fruit), native name *Angir*.

Trematosperma cordatum Urban.

The numerous herbaceous plants show no noticeable dominant.

On the level floors of the valleys which intersect the summit are green lawns of *Cynodon Dactylon* Pers., with a few large trees of *Ficus gnaphalocarpa* A. Rich., under whose shade in the grass are numerous

plants of the crocus-like *Merendera longifolia* Hutch. sp. nov. (see page 414).

In the higher and more exposed parts of the area, *Dracaena schizantha* Baker is conspicuous and fairly numerous among the *Buxus*.

On the Surud mountain (lat. $10^{\circ} 45' N.$, long. $47^{\circ} 12' E.$), 120 miles to the west of the frontier and of the area just discussed, somewhat different conditions prevail. The southern and south-eastern slopes are gradual and less subject to wash. *Buxus Hildebrandtii* appears to be entirely absent. The succulent zone does not appear on the upper part of the southern slopes, its place being taken, from 5800 to 6500 ft., by a rather sparse growth of:—

Dodonaea viscosa L.; *Aloe percrassa* Tod.; *Euryops Hildebrandtii* Mattf.; *Cadia purpurea* Ait.

The top of the Surud extends for several miles at an elevation of 6500 to 7520 ft. This area is covered with an almost continuous forest of *Juniperus procera* Hochst., which continues down the steep northern slope to below 6000 ft., covering the area of greatest rainfall. The dominants in this area are:—

Juniperus procera Hochst. Perhaps 65 or 70 per cent. of the trees present.

Sideroxylon buxifolium Hutch. sp. nov. (see page 413). Perhaps 10 per cent.

Cadia purpurea Ait. Perhaps 5 per cent.

Dodonaea viscosa L. Perhaps 2 or 3 per cent. No other tree is abundant.

Euryops Hildebrandtii Mattf. }
Salvia somalensis Vatke. } Forming a fairly thick under-
Stachys Hildebrandtii Vatke. } growth over much of the
ground.

Justicia Phillipseae Rendle. Present everywhere, and often forming a carpet.

Usnea articulata Hoffm. Thickly on the branches of trees.

The floors of the upper valleys, in the broader and more level spots, are grassy lawn-like areas of *Cynodon Dactylon* Pers., mixed with a fair quantity of *Eleusine Robecchii* Chiov.

The herbaceous flora of the Al Hills is found to some extent on the Surud, but the junipers provide less humus and less shade than the *Buxus*. The number of species is far less than that of the Al Hills.

The juniper is found only in small numbers on the Al Hills, and the trees are undersized. I am unable to suggest any material difference in soil, rainfall, wind, or aspect between the summits of the Al Hills and the Surud. The dominance of the juniper on the Surud would appear to be due to the greater elevation and lower temperature, although the two species are said to grow together on mountains further to the west.

EDAPHIC VEGETATION.

A somewhat uncommon phenomenon in North-east Somaliland is the occurrence of seepage cliffs, where water permanently oozes from the rock, usually forming a pool below. A good example is found at Buran. When sufficiently protected from the sun, a plentiful growth of the maidenhair fern, *Adiantum Capillus-Veneris* L., is found on the rocks, with *Erigeron Bovei* Boiss. where there is any soil. A considerable variety of rushes, sedges, and grasses may exist in the moist ground of the immediate vicinity.

In the southern foothills of the Al Hills at 2000-3000 ft. occur ravines, narrow and shaded, with a floor of loose rocks. The chief plants in these ravines are:—

Croton confertus Baker.

Bridelia somalensis Hutch. sp. nov. (see page 413).

Moringa peregrina Fiori (*M. aptera* Gaertn.).

Aristolochia rigida Duchartre. Common where it occurs, but not in all ravines.

At a lower elevation, as for instance at Karin (lat. $10^{\circ} 57' N.$, long. $49^{\circ} 24' E.$), 900 ft., in Italian Somaliland, where there is a pass through the hills, there occur "tug" beds covered with loose boulders and confined to somewhat narrow limits between the hills, with a considerable subterranean flow. These are occupied almost exclusively by two species of tree:—

Conocarpus lancifolius Engl. Growing to 70 ft.

Mimusops Angel Chiov. Perhaps one to every ten of the preceding species, and growing to 40 ft.

At Karin, in a broad valley where in the past there has been a considerable settlement and a European vegetable garden, are two areas of two to three acres, permanently damp with surface water. These areas contain:—

A tall palm, unidentified, native name *Madah*.

Phoenix reclinata Jacq. var. *somalensis* Becc. Growing thickly beneath the *Madah*.

Pluchea sp. (not in flower or fruit). Abundant in slightly drier ground than the *Phoenix*.

Erigeron Bovei Boiss. Abundant near open water.

A similar area at Marojeh (lat. $10^{\circ} 54' N.$, long. $48^{\circ} 59' E.$), 2250 ft., of three to four acres, also exhibits a growth of the *Madah* palm, and almost impenetrable thickets of the tall plume grass *Erianthus Ravennae* P. Beauv.

ECONOMIC NOTES.

With the exception of a few isolated areas of very small extent, no cultivation of crops is possible in North-eastern Somaliland, and none is attempted by the natives.

The juniper forests on the higher slopes of the coastal range are sufficiently extensive to furnish timber in commercial quantity, but its removal would be expensive and difficult, as several miles of

rough and steeply sloping surfaces would have to be negotiated before arrival at ground suitable for wheeled traffic.

The two species of frankincense, already referred to (page 405), are of common occurrence in suitable localities of the Al Hills. Gum was not being collected at the time of my visit, but it is said that the natives usually receive advances from Arab middlemen on the coast, to whom the gum is afterwards delivered at prices which are too low to encourage an increase of production. The collecting grounds are at the present time too remote from existing stations for effective control, but there would appear to be room for considerable development of this product when the country is further opened up.

SOMALI PLANT NAMES.

Native names were obtained for the great majority of the larger plants met with, and will be included in the account of the species collected, which is to appear at a later date. These names were gathered from reliable natives, and in most cases the plants were shown to more than one individual. It was found that dried or withered specimens were rarely recognised, and that information was only satisfactory when obtained with the aid of large fresh specimens or from the actual plant in the field.

It was also found that whereas all the Somali tribes speak the same language, their plant names vary very considerably. The name of a common plant in one part of the country may be transferred to another species in some other locality.

This question was carefully enquired into, and, while there was some diversity of opinion, it seemed to be well established that the names separate into two classes, those of the :—

(1) Darod tribes—Warsangeli, Mijertain, Dolbahanta, etc., which inhabit, roughly speaking, the eastern and less known side of the country, and the adjacent part of Italian Somaliland.

(2) Ishaak tribes—Habr Yunis, Habr Awal, Habr Toljalla, etc., which inhabit the rest of the country.

Some of the Dolbahanta (Darod) names, however, appear to agree with the Ishaak rather than the Darod, and two men of the Dolbahanta, from different districts, may use dissimilar names or a combination of Nos. 1 and 2.

The native Somali names which have hitherto been obtained by botanists are probably almost entirely Ishaak.

The spelling of the names has in nearly every case been checked with the aid of Europeans who speak the language, and occasionally a different spelling has been adopted from that appearing in previous lists.

In the case of a number of plants it was possible to arrive at the meaning of the native name, throwing light on the uses and attributes of the species. However, considerable caution had to be exercised in this enquiry, as it was most difficult for the native to distinguish between the actual *meaning* of the name and the

idea which the sound of the word brought to his mind. This may be paralleled in English by the word "oak," which does not mean "the sturdy one," nor "violet"—"the retiring one." Some of the alleged meanings had to be rejected for this reason and included in general notes on the plants.

Notes on certain species.

Short field notes will be included in the account of the species collected, but the two which follow are perhaps more suitable for the present report.

Aristolochia rigida Duchartre. This plant was found in flower somewhat uncommonly at Karin (Italian Somaliland) and in abundance at Marojeh (Al Hills). The flowers possess a fairly strong, carrion-like smell. The perianth-tube narrows at its base to a small circular opening, which leads to a roomy chamber containing stamens and pistil. The inner walls of the tube are covered with a thick growth of downwardly pointing hairs, while the circular opening is provided with a ring of hairs meeting in the centre and directed slightly towards the chamber. The chamber itself is free of hairs. Insects enter the perianth-tube, and once inside have difficulty in returning against the hairs. When past the circular opening they cannot return. After a short period, which was estimated from the appearance of the flowers at two or three days, the hairs wither and allow the insect to escape.

All the available flowers, to the number of two or three hundred, were opened, and those in which the hairs had not withered were usually found to contain captives. A collection of these was made, and consists of :—

- 40 diptera of about 11 species.
- 3 Lycaenid butterflies of 2 species.
- 6 moths of 4 species.
- 3 grasshoppers of 2 species.
- 1 cricket.
- 1 beetle.

Several grasshoppers and other insects which were far too large to enter the flowers were noticed endeavouring to do so. Over half the diptera exhibit bright yellow pollen adhering to the head and thorax, but the other insects do not show this, and were probably uninvited guests. No dead flies were found inside the flowers, but the lepidoptera were usually battered with struggling, and either dead or very exhausted.

Flying about and settling freely on the plants were a number of flies having pollen on the head and thorax, and it is evident that a proportion of these would eventually enter other flowers and effect fertilization.

Dorstenia crispa Engl. Native (Warsangeli) name *Bogoh-u-jed*, meaning "south-facing." Living rootstocks of the plant were brought home in addition to the usual dried specimens. The species was found in some quantity on the south and south-west sides of

boulders and rocks, growing in cracks and crannies at the place where the boulder touched the ground, and often under the protection and shade of a projecting ledge. No specimens were found on the north or shady side of the boulders. The boulders chosen were on level ground, usually on rock platforms, and no plants were found on cliffs or on an irregular surface.

Most of the rootstocks produce one or two rounded nodules on their upper surface, joined by a narrow neck to the main stem, and easily broken off.

It was strongly suggested by the position of the plants that, during the hot months of July to September, when the South-west monsoon is blowing, these nodules become detached and are blown before the wind until stopped by a rock.

Descriptions of the new species in this paper, by J. Hutchinson.

Sideroxylon buxifolium Hutch. sp. nov. [Sapotaceae]; affinis *S. oxyacanthae* Engl., sed inermis, foliis spatulato-obovatis longe petiolatis, floribus brevissime pedicellatis differt.

Arbor usque ad 6.5 m. alta, interdum frutescens; ramuli annotini pallide purpurei, leviter flexuosi, lenticellis transverse porosis notati, hornotini elongati, subdense foliati, minute stellato-puberuli, cinerei. *Folia* spatulato-obovata, apice rotundata, basi acute cuneata, 2-4 cm. longa, 1-1.5 cm. lata, supra glabra et nitida, infra cinereo-tomentella, coriacea; petioli circiter 3 mm. longi, stellato-tomentelli. *Flores* axillares, glomerati, breviter pedicellati, pallide viridi-flavi; pedicelli crassi, ferrugineo-tomentelli. *Sepala* libera, suborbicularia, 2 mm. diametro, coriacea, extra ferrugineo-tomentella, marginibus interdum hyalinis. *Corollae tubus* late campanulatus, intra tenuiter pilosus, 1.5 mm. longus, lobis late ellipticis 2 mm. longis apice bilobatis. *Stamina* corollae lobis longiora; staminodia petaloidea, triangularia, acutissime acuminata. *Ovarium* tomentosum, sulcatum; stylus 2 mm. longus, glaber.

Somaliland: Surud Range; Shimba Beris, lat. 10° 45' N., long. 47° 12' E., 6750 ft., abundant in rocky ground, Nov., *Collenette* 371. Vernacular name *Sheh* (Ishaak tribes).

A very distinct species with leaves like those of *Buxus Hildebrandtii* Baill.; the filaments are very long for the genus *Sideroxylon*. The allied species *S. oxyacantha* Engl. occurs in Eritrea and Abyssinia.

Bridelia somalensis Hutch. sp. nov. [Euphorbiaceae]; affinis *B. scleroneurac* Muell. Arg., sed foliis infra glabris minus reticulatis distincta.

Arbor 5 m. alta; ramuli annotini purpurascens, glabri, hornotini graciles. *Folia* oblonga vel oblongo-lanceolata, apice obtusa vel rotundata, basi rotundata, 5-9 cm. longa, 2.5-3.5 cm. lata, chartacea, glabra, supra pallide viridia, infra pallidiora, inconspicue reticulata, nervis lateralibus utrinsecus circiter 12 marginem versus obscure arcuatis, tertiariis subparallelis; petioli sicco nigrescentes, 5 mm.

longi, glabri; stipulae subulato-lanceolatae, 4 mm. longae, marginibus minute ciliolatis. *Flores* ♂ virides, axillares, glomerati, sessiles. *Sepala* ovato-triangularia, glabra, 2.5 mm. longa. *Petala* cuneato-obovata, sepalis dimidio breviora. *Discus* patelliformis, margine leviter undulatus. *Antherae* subobtusae. *Ovarii* rudimentum bilobatum. *Flores* ♀ non visi. *Fructus* 2-ocularis, late ellipsoideus, 8-10 mm. longus, siccitate verrucosus.

Somaliland: Marojeh, 2250 ft., lat. 10° 54' N., long. 48° 59' E., among boulders in dry stream bed, common tree 14 ft. high, flowers not common, green, Nov., *Collenette* 224.

Vernacular name *Hambah Jujh* (Warsangeleh).

Merendera longifolia Hutch. sp. nov. [Liliaceae]; affinis *M. abyssinicae* A. Rich., foliis multo longioribus et latioribus marginibus scabrido-serrulatis, floribus majoribus, antheris brevioribus distinctissima.

Cormus late ellipsoideus, circiter 3 cm. longus; scapus intra vaginas usque ad 10 cm. longus, biflorus. *Folia* coaetanea, plerumque 3 vel 4, linearia, acuta, usque ad 10 cm. longa et 1.5 cm. lata, glabra, circiter 7-nervia, marginibus angustissime translucentibus et scabrido-serrulatis. *Perianthii segmenta* rosea, a basi distincta, lanceolata, longe unguiculata, circiter 5 cm. longa. *Filamenta* robusta, 5 mm. longa, sulcata; antherae 4 mm. longae, oblongae, basi breviter 2-lobae. *Ovarium* lineari-lanceolatum, laxe syncarpum, glabrum; styli a basi distincti, 2.3 cm. longi.

Somaliland: Sugli, Al Hills, 4750 ft., lat. 10° 58' N., long. 48° 53' E., flowers mauve, in short grass under shade of large trees, sandy soil, Nov., *Collenette* 254.

Hitherto only one species of *Merendera* has been known from Tropical Africa, *M. abyssinica* A. Rich. being found on the lower slopes of mountains in Abyssinia. This new species discovered by Mr. Collenette in Somaliland is very distinct on account of its long leaves, which lie flat on the ground, and by the large handsome flowers. It would probably prove to be a desirable plant for cultivation.

LIII.—SESSE CANOES. C. M. HARRIS.

During my stay at Government House, Entebbe, His Excellency the Governor took me to see a fine Sesse Canoe which was in use as a ferry boat across a narrow arm of the Victoria Nyanza. As I noticed that the canoe was made of various kinds of wood and learnt that specific timbers were always used for the different parts—sides, thwarts, prow, etc.—I asked Mr. C. M. Harris, of the Uganda Forestry Department, to be so kind as to find out what the various timbers and lianes might be and to send me an account of the construction of these remarkable canoes, which appear to be somewhat unique in their methods of construction.