INTRODUCTION

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INTRODUCTION.

By HARRY BOLUS, D.Sc., F.L.S.

The Cape Peninsula is a narrow mountainous tract of land lying in a direction nearly due north and south, situate at the south-western extremity of Southern Africa. In length it is about forty miles (from Mouille Point to Cape Point), with a width varying from two to eight or nine miles. For the purposes of this inquiry and to avoid the tortuous line of an ill-defined water-shed, an arbitrary line has been assumed as its landward boundary across the low-lying sandy isthmus which connects it with the mainland. This line, which is about thirteen miles in length, lies in a north-easterly and easterly direction three miles distant from, and parallel with, the great high-road which skirts the foot-hills of the mountain range, and which runs from Cape Town to Muizenberg (continuing to Simon's Town). Thus, it commences from the shore of Table Bay, a little beyond Salt River, and terminates on the shore of False Bay, three miles east of the eastern extremity of the Muizenberg. The area of the Peninsula thus enclosed is $197\frac{1}{2}$ square miles,* or about one-fourth larger than the Isle of Wight, which contains 155 square miles.

When we speak of a Peninsula we also, by a natural connection of ideas, think of an island. When we discuss its physical characters, and more especially its natural history, it is almost necessary to know something of the nature of its connection with the mainland from which it is partially cut off. From the mountain range, then, which forms the backbone of the Peninsula there stretches a wide expanse of sandy downs, broken here and there into low, yet still sandy, hills or hillocks. That portion of this expanse which is within our limits lies at an altitude of from forty to one hundred feet above the level of the sea. But further landward the hills gradually attain a greater height, and become less sandy, until at length, towards the north-east, the Tygerbergen and other important hills are reached at a distance of about twelve miles, and on the east at twenty-five to thirty miles, the great range of mountains known in that portion as the Hottentots-Holland Mountains, attaining to a height of from 1,500 to 5,000 feet.

These downs, commonly known by the name of the "Cape Flats,"

* For this calculation I am indebted to the kindness of Abraham de Smidt, Esq., formerly Surveyor-General of the Cape Colony.

have a climate very similar to that of the Peninsula in its lower portions, except that the rainfall is less, and the temperature is probably somewhat warmer. But there is little to lead us to suppose that they present any serious barrier to the transmigration of living organisms; and, as a matter of fact, a large number of vegetable forms in the Cape Peninsula are identical with, or closely allied to, those in the region immediately beyond it; in other words, the Cape Flats forming the isthmus constitute, in no respect, a boundary between two Floral Regions.

THE SOUTH-WESTERN REGION OF THE CAPE FLORA.

A few words may conveniently here be said respecting the Floral Region of which the Cape Peninsula forms the south-western extremity. This consists of an angular littoral strip, bounded on the west coast by the Olifant's River; thence inland to the Bokkeveld Berg, and southward along considerable mountain chains under various names; thence eastward, generally more or less parallel with the coast, until at last they trend towards the sea near the districts of Humansdorp and Uitenhage. About this part the South-western Region gradually passes into the Eastern or Sub-tropical Region, in the neighbourhood of the Van Stadensbergen, in the latter district.* Its greatest width does not exceed eighty, and probably averages not more than fifty miles; while its length measured along the middle is about 500 miles. Its boundaries, since it passes over to other Regions both on its northern and eastern extremities, by a gradual transition, are necessarily somewhat arbitrary and approximate. But inland, where the mountains form an effectual check to the rain-bearing winds, (whether from the westward or south-eastward) the boundary-line is much more definite.

Professor Ernst Meyer, of Koenigsberg, and J. F. Drège, the botanical explorer and traveller (1826-34), were the first to investigate South Africa from a phytogeographic point of view and to publish a detailed scheme for its division into botanical Regions and Sub-Regions.† These were based upon laborious recorded observations,

* Recent German writers have established a Transition Region (*Uebergangsgebiet*) between what I have called the South-western and Sub-tropical Regions. This appears to be scarcely an improvement on Drège's chief divisions. It multiplies their number, which seems undesirable in view of the advantages of clearness and simplicity; it makes two somewhat arbitrary boundaries instead of one; and is open to the objection that the process of division might, with equal reason, be carried on indefinitely.

† *Commentariorum de Plantis Africæ Australioris*, Leipsic, 1835; and *Zwei Pflanzen geographische Documente, nebst einer Einleitung von Dr. F. Meyer*, in the "Flora" for 1843, vol. ii.

and thus constituted the foundation of all future work upon the subject. The authors divided the Cape Colony and Natal into five great divisions. Of these, the third, named by them "*Terra inferior Occidentalis*," and the fourth, "*Terra inferior Australis*," are almost exactly what I have called the South-western Region.

This Region, which I have treated of somewhat more fully, though quite inadequately, elsewhere ("*Sketch of the Flora of South Africa*," in the *Official Handbook of the Cape of Good Hope*, 1886), is probably one of the oldest, most distinct, and most interesting, botanical Regions of the world. Though it has now been considerably explored, probably 90–95 per cent. of its species being known, no systematic tabulation or census of its Orders, genera, and species has been made within recent years; and Drège's researches, valuable as they were, taken alone, are too incomplete to be useful at the present time.

The chief characteristics of the Flora of the South-western Region, as to its general appearance, and stating them very briefly, are:—

1. The great prevalence of dwarf bushy plants, with small and often heath-like leaves.
2. A deficiency in the luxuriance of the vegetation.
3. The general paucity of trees (only the small forest-area near its eastern extremity being excepted).
4. A deficiency of stretches of grass, or turf-formations; grasses being by no means wanting, but characterised by growth in separate tufts, intermingled with other plants.
5. The fewness of sociable plants, *i.e.*, of species growing together to the more or less complete exclusion of others.
6. The small proportion (in individuals rather than in species) of annual plants.
7. The great diversity of species; or, in other words, the large proportion of species which have a small area of distribution.
8. The small proportion, both in respect of species and individuals, of introduced, or foreign plants (excepting only recent forest-plantations).

In all these characters the Flora of the Peninsula agrees with that of the larger Region of which it forms part.

In respect of the systematic character of the Flora of the South-western Region, as above stated, the data for an exact comparison are wanting. For the most part, doubtless, the chief Orders and genera are the same. But towards the eastern portion of the Region the influence of the Eastern or Sub-tropical Flora begins to be felt; whereas in the Cape Peninsula it is scarcely perceptible. Speaking broadly, the orders ORCHIDACEÆ, ERICACEÆ, and FICOIDEÆ probably

rank in a higher position in our Peninsula List than they would in that of the South-western Region as a whole, while some others would be proportionately lower; but the differences would probably be inconsiderable.

SKETCH OF THE PHYSIOGRAPHY OF THE PENINSULA.

The Peninsula itself is traversed throughout its entire length by a range of mountains (with some lower intervals) which are at their loftiest point in the well-known Table Mountain, near Cape Town (3,562 feet); and which gradually diminish toward their southern extremity.

The exposed rocks are, for the most part, the series known as the "Table Mountain Sandstone"; secondly, and chiefly on the Lion's Mountain, the older clay-slate, or "Malmesbury Beds." The soil from the first formation is chiefly of a sandy character, with, in some parts, a remarkably small admixture of humus; from the clay-slate it is a reddish, not very tenacious, clay. These are pierced, here and there, by outcrops of granite, which are of comparatively small superficial extent. With insignificant exceptions tertiary deposits are absent, occurring only in low places and of shallow depth. The influence of soils upon the distribution of plants in South Africa has not yet been investigated, and would be a new and interesting field for the student of œcological botany.

METEOROLOGY.

The mean annual temperature is 61°·25 F. (16°·25 C.) at the Royal Observatory, about 40 feet above the sea-level; of the six summer months 68° F. (20° C.); of the six winter months 54°·5 F. (12°·5 C.). The minimum temperature recorded at the same station in the year 1898 was 34°·1 F. (in June); the maximum, in a Stevenson screen, 95°·7 F. (in Feb.). These extremes are of short duration and infrequent occurrence, and vary in different parts of the Peninsula. Frosts are practically unknown, and never such as to affect the vine, which is largely cultivated.

The rainfall varies considerably in different parts of the Peninsula, owing, apparently, to the position of each spot relatively to the conformation of the mountains, and to the prevailing rain-bearing winds. For the ten years 1885–1894 the annual average fall was at Sea Point, 21·35 inches; in Cape Town, 23·84; at the Royal Observatory, 27·95; at Wynberg, 42·83; on Table Mountain (Waaï Kopje), 61·97 in. The extremes are considerable. At the

station at Kenilworth, Wynberg, during thirteen years (1889–1901) the maximum annual fall was 63·08 in. ; the minimum, 32·30 in. The proportionate fall during the several seasons appears to be more regular. Nearly three-fourths (at Kenilworth, Wynberg, during thirteen years, the mean proportion was 73 per cent.) of the total annual fall takes place in the five months May–September, inclusive. During the remaining seven months, and especially in January–April, the fall is very deficient, and the surface soil, in dry years, becomes extremely dry ; until, at varying dates in April–May, the winter rains again set in. Snow or sleet occasionally, or rarely, falls on Table Mountain, but not in every year, and rapidly vanishes.

Thunderstorms are uncommon, comparatively slight, and of short duration.

The prevailing winds are in the winter months from W. to N. W. ; in the summer months from S. to S.E. ; and often blow with considerable force.

ASPECT OF THE VEGETATION.

The prevailing aspect of the vegetation, apart from the modifications effected by the hand of man, is that of a number of low-growing shrubs, of a dark or bluish-green hue. At a distance these appear to be growing closely, but this is not generally the case. The mountain-sides on the north and west mostly appear barren and dry, except for a month or two in early spring, an appearance due to the absence of turf. But on the eastern sides they are of a more luxuriant green, and everywhere the deep and steep ravines are clothed with groves of dark-foliaged dwarf trees and shrubs, few of which attain a greater height than 20 feet to 30 feet, and many even less. Amongst them may be named the genera:—*Scolopia*, *Kiggelaria*, *Grewia*, *Ilex*, *Gymnosporia*, *Pterocelastrus*, *Cassine*, *Hartogia*, *Scutia*, *Noltea*, *Rhus*, *Virgilia*, *Cunonia*, *Olinia*, *Curtisia*, *Plectronia*, *Myrsine*, *Sideroxylon*, *Royena*, *Olea*, *Brabejum*, *Podocarpus*, &c. On the open mountain-sides and foot-hills are also some of the foregoing, together with more scattered bushes, and especially numerous *PROTEACEÆ*: *Leucadendron*, *Protea*, *Leucospermum*. The well-known *Leucadendron argenteum*, or “Silver-tree,” is a prominent feature in some parts, growing in a zone between about 400 feet to 1,000 feet above the sea ; *Leucospermum conocarpum* is still frequent, but of late years has been much destroyed for firewood.

On the lower foot-hills and on the Flats the bulk of the vegetation consists of small shrubs, of which one of the chief peculiarities,

already referred to, is the large proportion which bear small and narrow or heath-like leaves. These occur in very diverse Orders and genera, a few of which only can be mentioned: In POLYGALACEÆ (*Polygala*, *Muraltia*); RUTACEÆ (*Macrostylis*, *Diosma*, *Coleonema*, *Agathosma*, many); RHAMNACEÆ (*Phyllica*, many); LEGUMINOSÆ (*Cyclopia*, *Amphithalea*, *Lebeckia*, *Aspalathus*, many,—*Indigofera*); ROSACEÆ (*Cliffortia*); BRUNIACEÆ (*Berzelia*, *Brunia*, *Staavia*); FICOIDEÆ (*Acrosanthes*, *Pharnaceum*, *Cælanthium*, *Adenogramma*); RUBIACEÆ (*Anthospermum*, *Nenax*, *Carpacoe*); COMPOSITÆ (many species, chiefly in the genera *Felicia*, *Helichrysium*, *Metalasia*, *Eriocephalus*, and others); CAMPANULACEÆ (*Lobelia*, *Lightfootia*, *Wahlenbergia*, *Roella*, *Prismatocarpus*, &c.); ERICACEÆ (the entire Order, as here represented by about 112 species); SELAGINACEÆ (*Selago* and several species of five other genera); PROTEACEÆ (several species of seven genera); THYMELÆACEÆ (*Passerina*, *Chymococca*, *Cryptadenia*, *Lachnæa*, *Struthiola*, *Gnidia*); SANTALACEÆ (*Thesium*, many species); EUPHORBIACEÆ (a few species).

Intermingled with these there is an immense variety of other plant-forms: annuals, herbaceous perennials, succulents, bulbous plants with conspicuous or small petaloid flowers, glumaceous plants, &c., of which only a few of the more striking can here be mentioned.

Annuals are small in number of species compared with other plants; and only a few occur in considerable number as to individuals. Amongst the more noticeable are *Helioiphila pusilla* and *pilosa*; *Grammanthes gentianoides*; *Mesembrianthemum pyropæum* and *criniflorum*; *Charieis heterophylla*; *Cotula turbinata*; *Senecio arenarius*, and others; *Gymnodiscus capillaris*; *Dimorphotheca pluvialis*; *Ursinia* spp.; *Cryptostemma calendulaceum*; *Venidium hirsutum*; *Hypochæris glabra*; *Sonchus oleraceus*; *Sebæa aurea* and *albena*; *Belmontia cordata*; *Diascia montana* and *sabulosa*; *Nemesia barbata* and *pinnata*; *Zaluzianskya villosa*; *Harveya* spp., several of which are very handsome; *Hyobanche sanguinea*; *Utricularia capensis*, and others.

Amongst the more conspicuous or noteworthy dicotyledonous perennials are the fine *Anemone capensis*, on the higher mountain-sides; the lovely blue *Nymphæa stellata*, in the pools on the eastern side; *Polygala virgata* and *myrtifolia*; several *Pelargonium*; many LEGUMINOSÆ, especially the handsome *Podalyria calyptrata* and *Liparia spherica*; amongst BRUNIACEÆ (which, though having inconspicuous flowers, are interesting as a purely South African Order), three species are somewhat abundant, viz., *Berzelia abrotanoides*, *Brunia nodiflora*, and *Staavia radiata*, besides the more

local *S. Dodii*, of which the large white radiating involucre scales produce the aspect of a shrubby *Chrysanthemum*; lastly, the heath-like *Audouinia capitata* (so frequently taken by the tyro for an *Erica*). In COMPOSITÆ the Flora is also rich in handsome species, as *Aster fruticosus*; many *Heliptera* and *Helichrysa*; *Phænocoma prolifera*; *Alciope tabularis*; *Senecio elegans*, *concolor*, *glastifolius*, *verbascifolius*, and others; *Gazania*, 2 spp.; *Berkheya grandiflora*; *Gerbera Wrightii*, and the curious fern-like-leaved *G. asplenifolia*. In ERICACEÆ, the Peninsular species of *Erica*, though so numerous (92), are not by any means the finer ones of the genus. The most attractive are *E. mammosa*, *alveiflora*, *purpurea*, *abietina*, *verticillata*, *pyramidalis*, *cerinthoides*, *baccans*. In BORAGINACEÆ, *Lobostemon argenteus* and *fruticosus*. In SELAGINACEÆ, *Selago serrata* and *spuria*. In VERBENACEÆ, *Stilbe ericoides*. In LABIATÆ, *Salvia aurea* and *nivea*; *Leonotis Leonurus*. Of PROTEACEÆ the most abundant are, besides those already named, *Leucadendron Levisanus*; *Protea Scolymus*, *cynaroides*, *incompta*, *Lepidocarpon*, *mellifera*; *Serruriz* are numerous both in species and individuals, but of little beauty; *Mimetes hirta*, *decapitata*, *Hartogii*, *cucullata*, chiefly in the southern part of the Peninsula. In THYMELÆACEÆ, *Passerina filiformis*, abundant but insignificant; *Chymococca empetroides* (a graceful shrub of the seashore, with small flowers, but bright scarlet berries which are often used for Christmas decorations); *Struthiola erecta*; *Gnidia pinifolia*; *Lachnæa capitata*. In PENÆACEÆ the following mountain species are pretty, and interesting as representatives of a purely South African Order: *Sarcocolla*, 2 or 3 spp., and *Brachysiphon imbricatus*.

Succulent plants, as a whole, do not make a great show. They are chiefly found in the Orders CRASSULACEÆ and FICOIDEÆ. The former includes the fine *Rochea coccinea*, so long cultivated in Europe; of the latter the *Mesembrianthemata* include a few brilliant species which sometimes form large masses of flowers.

Amongst the Monocotyledons Orchids are numerous in species, some few also in individuals. The well-known *Disa uniflora* heads the list, though now seldom seen in quantity; and the beautiful blue species of different hues—*D. graminifolia*, *purpurascens*, and *longicornu*, the scarlet *D. ferruginea*, and the lovely white *D. fasciata*, occasionally occur in considerable numbers. Most of the species of other genera are scattered, and comparatively insignificant in effect, excepting *Satyrium coriifolium*, which is common, and of which the flowers, though not large nor growing in masses, are of so vivid a flame-colour as to attract the eye upon the sandy downs. In HÆMODORACEÆ, *Wachendorfia paniculata*, with tawny yellow

flowers, is common. In IRIDACEÆ, AMARYLLIDACEÆ, and LILIACEÆ the number of genera and species with handsome, striking flowers, and occurring in quantities, is so great that to name them would be a repetition of the larger part of the list which follows. The most prominent genera are *Moræa*, *Bobartia*, *Aristea*, *Ixia*, *Watsonia*, *Babiana*, and *Gladiolus*; of AMARYLLIDACEÆ, *Hypoxis*, *Amaryllis*, and *Nerine*; of LILIACEÆ, *Agapanthus*, *Lachenalia*, *Ornithogalum*. *Typha capensis* (the Cape "Bulrush"), and *australis* occur along the streams on the Flats. Our only Aroid, the well-known *Richardia africana*, occurs in abundance in tolerably moist meadows, and excites the admiration of all visitors.

Of the glumaceous Orders, the JUNCACEÆ are chiefly remarkable for the monotypic genus *Prionium*, locally known as the "Palmiet" (*P. Palmita*), which occurs in the mountain streams, but scarcely attains the size which is seen in the rivers further northward and eastward. The most prominent position of all these is taken by the RESTIONACEÆ, which form one of the chief features in the floral landscape. They grow in vast numbers on the sandy soil of the Flats and also on the mountains, several species of *Restio* and *Thamnochortus* acquiring a height of six feet or more, in large tufts, and having a somewhat mournful though imposing appearance; other species, as of *Elegia*, *Dovea*, *Hypodiscus*, &c., are more elegant, and are often gathered for ornamental purposes. Of CYPERACEÆ the most abundant both in species and individuals are the genera *Scirpus*, *Ficinia*, and *Tetraria*. Some tall species of *Cyperus*, as *C. textilis*, *longus*, and *fastigiatus*, occur along the streams. *Carpha glomerata* is a striking large grass-like plant growing sparingly on the mountains and on the Flats. *Schænus nigricans* is interesting as an additional evidence of the affinity of our Flora with that of Australia (see a recent most suggestive paper by Mr. C. B. Clarke, F.R.S., on the "Antarctic Origin of the tribe Schœneæ," Proc. of the Royal Society, v. 70, p. 496 *et seq.*); *Ecklonea*, and *Chrysithrix*, as endemic genera, of the latter of which a second species was quite lately discovered within our limits by Major Wolley-Dod. Of the vast genus *Carex*, only twenty-two species occur in the whole South African Flora, and of these seven species are found on the Peninsula.

Respecting the grasses, I have already mentioned their general habit of growing in scattered tufts. *Stenotaphrum glabrum* and *Cynodon dactylon*, both almost cosmopolitan, are much used for lawns and meadows, but do not appear to grow thus except in cultivation or where the ground is cleared for them. *Phragmites communis*, the common English "Reed," also a cosmopolitan species, occurs on the margins of "Vleis" or pools.

Amongst the Ferns may be mentioned the fine *Hemitelia capensis* or "Tree-fern," found in the ravines on the east side of Table Mountain, the stem or caudex of which attains a height of five or six feet. The European *Pteris aquilina*, or "Bracken" is common chiefly among the woods of the foot-hills. *Vittaria lineata*, a curious grass-like fern, seems now somewhat rare. *Osmunda regalis* is included on the authority of old collectors, but has not been recorded in recent years, and it may be feared is now extinct on the Peninsula. *Ophioglossum Bergianum* is singular as one of the smallest of the genus; not rare, yet perhaps on account of its tiny size generally overlooked by collectors.

AQUATIC PLANTS.

Aquatic plants, though by no means wanting, are yet perhaps less abundant than in many other countries. Surface water is not abundant on the Peninsula, and much of it becomes dried up, or nearly so, before the end of the summer. The most common and abundant of the aquatics is perhaps *Aponogeton distachyon*, and the less common *A. angustifolium*. Besides these the following occur: *Ranunculus rigidus*, *Nymphaea stellata*, *Oxalis natans*, *Crassula natans*, *Cotula myriophylloides*, *Limnanthemum Ecklonianum*, *Hypoxis aquatica*, *Dipidax triquetra*, *Typha* 2 spp., *Potamogeton pusillus*, *Ruppia* 2 spp., *Zannichellia palustris*; and 6 CHARACEÆ.

SOCIABLE PLANTS.

Of sociable plants in the strict sense of the term, *i.e.*, of plants growing closely together to the exclusion of all others, there are none on the Cape Peninsula. Two species only have ever been seen by the writer, during a residence of twenty-seven years, growing in such quantity and proximity as to give, when in flower, a colour to the mountain-side when viewed at a distance of two to three miles. These are *Podalyria calypttrata*, and *Erica hirtiflora*; but it is not to be supposed that this occurs every year, or even frequently. These may be said to grow subsocially, and to them should perhaps be added *Leucadendron argenteum*.

TREE-PLANTING.

Finally, a few words may be said on the change in the floral landscape produced by tree-planting. On the mountain-sides,

chiefly on the eastern slopes, large plantations have been made of the common Oak, of Pines, chiefly *Pinus pinea* and *P. pinaster* (the Stone and Cluster Pines), and some Australian *Eucalypti*; and on the Flats, of Australian *Acaciæ* or Wattles. These have been made mostly by the Government Forest Department, and are growing well. All over the suburbs eastward of Cape Town these trees have also been planted largely, and give to the country a forestal aspect which it certainly did not possess before the advent of Europeans, or even until comparatively recent years. Of these foreign trees, though several now produce seed and grow spontaneously, none seem to have established themselves so vigorously as the Cluster Pine, and perhaps some of the Australian *Acaciæ* (*A. decurrens* and *A. saligna*). The Pine is longer-lived than the *Acaciæ*, and moreover almost completely kills out the indigenous undergrowth, yet, when they are planted together, I have observed that the Pine appears to dislike and suffer from the contact more than does the *Acacia*.

If one may for a moment give the reins to imagination and suppose that man and his interference were withdrawn from the Peninsula for a few hundred years, it is easy to dream that a conflict might ensue between the trees last mentioned for the mastery of the vegetation of the whole area; and that whatever the result of this struggle the whole face of Nature would be changed, so far as the vegetation was concerned, to a monotonous and mournful character.

VERTICAL RANGE OF PLANTS.

The great vertical range of certain plants on the mountains of the Peninsula should be noticed. The observations hitherto made are very scanty, and more complete investigation will doubtless show a much larger number of similar cases. I give the following list of plants, with a range of 1,000 feet or over, from records made at various times. The headings of the groups, it must be remembered, bear no reference to the actual height of the station of the plants above the level of the sea, but only to the extent of their range in altitude so far as observed or recorded. Thus, *Polygala bracteolata*, having been recorded at 100 feet and also at 1,800 feet of altitude, is placed in the first group of plants having a range of from 1,000 to 2,000 feet.

Having a range of from 1,000 to 2,000 feet.

<i>Polygala bracteolata</i>	<i>Liparis capensis</i>
<i>Oxalis pentaphylla</i>	<i>Eulophia tabularis</i>
<i>Erica calycina</i>	<i>Bartholina Ethelæ</i>
„ <i>pulchella</i>	<i>Satyrium saxicolum</i>
<i>Simochilus fasciculatus</i>	<i>Disa racemosa</i>
<i>Olea capensis</i>	„ <i>melaleuca</i>
<i>Sarcocolla squamosa</i>	„ <i>Richardiana</i>
<i>Brachysiphon imbricatus</i>	„ <i>porrecta</i>
<i>Podocarpus Thunbergii</i>	<i>Aristea spiralis</i>
<i>Callitris cupressoides</i>	

From 2,000 to 2,500 feet.

<i>Psoralea aculeata</i>	<i>Satyrium candidum</i>
<i>Rhynchosia glandulosa</i>	<i>Disa uniflora</i>
<i>Hermas capitata</i>	„ <i>ophrydea</i>
<i>Helichrysum fruticans</i>	„ <i>tenuifolia</i>
<i>Alciope tabularis</i>	„ <i>rosea</i>
<i>Erica sebana</i>	<i>Pterygodium acutifolium</i>
„ <i>glutinosa</i>	„ <i>carnosum</i>
„ <i>nudiflora</i>	<i>Ceratandra atrata</i>
<i>Bellardia Trixago</i>	<i>Watsonia Meriana</i>
<i>Satyrium bicornne</i>	„ <i>humilis</i>
„ <i>odorum</i>	<i>Richardia africana</i>

From 2,500 to 3,000 feet.

<i>Helipterum speciosissimum</i>	<i>Erica depressa</i>
<i>Osmitopsis asteriscoides</i>	<i>Disa graminifolia</i>
<i>Crassula centauroides</i>	<i>Bobartia filiformis</i>
<i>Erica Halicacaba</i>	

From 3,000 to 3,500 feet.

<i>Psoralea aphylla</i>	<i>Penæa mucronata</i>
<i>Mairea taxifolia</i>	<i>Disa micrantha</i>
<i>Helichrysum sesamoides</i>	„ <i>cornuta</i>
<i>Senecio pubigerus</i>	„ <i>patens</i>
<i>Villarsia ovata</i>	<i>Gladiolus arenarius</i>
<i>Protea cynaroides</i>	

Similar conditions of a high range, in a still greater degree, were observed and recorded by Philippi on Mount Etna in Sicily

(*Linnaea*, vol. vii. (1832), p. 727 and foll.). There, in a not very different latitude ($37^{\circ} 44'$) and climate, similar circumstances of a high (in that case a much higher) mountain, surrounded by a warm sea, have produced, in a very different Flora, similar results. Hooker also, in his *Introductory Essay to the Flora Indica* (1855), p. 39, states that "almost every Himalayan plant has a vertical range of nearly 4,000 feet, and many of 8,000." These data stand in striking contrast to the observations recorded by Watson and others in Britain.

SYSTEMATIC ELEMENTS OF THE FLORA.

The structural or systematic character of the plants composing the Flora of the Peninsula may now be considered, with a view to enable us more readily to form a comparison with that of other Regions in South Africa, or elsewhere.

The proportion borne by the species of Monocotyledons (680) to those of Dicotyledons (1,437) is as 1:2.11. This is a high proportion for the former, and is doubtless due to what is regarded as the favouring circumstance of a moist coast climate. As we proceed inland the Monocotyledons appear to diminish; on the higher plateau of the Upper Region of the Cape Colony (Nieuwveld, Uitslugt, and Winterveld) they rank, according to the observations of Drège, as 1:4.9. In England the proportion is about 1:3.3; in Greenland as 1:2; in Greece as 1:5.7. These two last are the extremes which I have been able to find recorded.

It has been aptly remarked by Ernst Meyer, in the work I have already cited, that "in the consideration of single families, two very different points of view present themselves, viz., their *absolute* and their *relative* numbers in our Flora in comparison with their numbers in other Floras. The same family may be equally important to a Flora in both respects, as, for example, Selaginæ and Mesembrianthemæ in South Africa. But, as a matter of course, the most numerous family of any particular Flora may be one least peculiar to it; while one wholly peculiar [as, *e.g.*, PENÆACEÆ in South Africa] may be least numerously represented." The truth of this observation will be presently illustrated.

The following is a list of those Orders, twenty-four in number, arranged according to their numbers in indigenous species,* which form at least 1 per cent. of the total Flora:—

* In this and all subsequent statistical remarks indigenous species only are taken into account; *i.e.*, excluding all plants which there is reason to believe or suspect have been introduced by human agency.

	Species.	Per cent. of the whole native Phanerogamic Flora.
Compositæ	254	12·01
Leguminosæ	156	7·38
Iridaceæ	119	5·63
Orchidaceæ.....	117	5·53
Cyperaceæ	115	5·44
Ericaceæ.....	112	5·24
Gramineæ	95	4·49
Ficoideæ	91	4·30
Restionaceæ	89	4·21
Liliaceæ	83	3·92
Geraniaceæ.....	65	3·07
Scrophulariaceæ	60	2·84
Campanulaceæ	59	2·79
Proteaceæ	47	2·22
Crassulaceæ	40	1·89
Umbelliferæ	38	1·80
Rutaceæ	31	1·46
Cruciferae	30	1·42
Thymelæaceæ	29	1·37
Polygalaceæ	29	1·37
Rosaceæ	29	1·37
Amaryllidaceæ	27	1·28
Selaginaceæ	26	1·23
Gentianaceæ	24	1·13
	<hr/> 1,765	<hr/> 83·39
69 Orders each with less than 1 per cent. ...	352	16·61
	<hr/> 2,117	<hr/> 100·0

Here, COMPOSITÆ head the list, but they are numerous in the Flora of all countries and occupy the first place in most. On the other hand, BRUNIACEÆ, PENÆACEÆ, and GRUBBIACEÆ, which are entirely confined to South Africa, are not sufficiently numerous in species to appear in the first list above cited; and SELAGINACEÆ which, with one single exception, are also all South African, only occupy a very low position in it.

LEGUMINOSÆ, CYPERACEÆ, and GRAMINEÆ, which occupy the second, fifth, and seventh places respectively, would also take a prominent place in the Flora of any similarly situated country.

But it is in the high rank which is taken by the Orders IRIDACEÆ,

ORCHIDACEÆ, ERICACEÆ, RESTIONACEÆ, FICOIDEÆ, GERANIACEÆ, and PROTEACEÆ that the chief distinctive characters of the Peninsular Flora, taken as a whole, will be found. To these may be added, as a character of secondary importance, the presence of a considerable number of genera rich in species, of which some details will be now adduced.

The 2,117 species of native flowering plants enumerated in the "List" belong to 93 Orders and 485 genera. The average number of species to each genus is therefore 4·36.* This, from a comparison with other Floras of a similar size, is somewhat high, and seems to stand in opposition to the greatly diversified character which has been noted by previous writers as one of the most marked features of the South African Flora generally. It appears, however, to be chiefly due to the presence of a few genera very numerous in species. This is shown by the following list of the largest genera :—

	Species.
Erica	92
Mesembrianthemum	61
Aspalathus	50
Disa	47
Senecio	40
Ficinia	36
Oxalis	32
Pelargonium	30
Crassula	29
Helichrysum	29
Restio	29
Gladiolus	24
	<hr/>
	499

We have, therefore, the first four genera with 250 species, or very nearly 12 per cent. of the whole; and twelve genera with 499 species, or 23·59 per cent. of the whole native Flora.

Most of these large genera are either exclusively South African or genera having their largest or at least a very large development in South Africa, the cosmopolitan *Senecio* being the only exception. But it is even more significant that, with two exceptions (*Mesembrianthemum crystallinum* and *Senecio vulgaris*), all the Peninsular species of these large genera are, so far as I have been able to

* In Mr. Wood's Catalogue of the Flora of Natal (a very much larger area) the average is 3·12 species to each genus.

ascertain, peculiar to Southern Africa, and the great majority to its South-western Region.

Besides the above there are twenty genera each containing 15 or more species, viz., *Cliffortia*, 23; *Heliphila*, 22; *Satyrium*, *Scirpus*, each 21; *Muraltia*, *Lobelia*, and *Thesium*, each 18; *Tetraria*, 17; *Hermannia*, *Phyllica*, *Indigofera*, *Moræa*, and *Thamnochortus*, each 16; *Agathosma*, *Serruria*, *Gnidia*, *Pterygodium*, *Anthericum*, *Juncus*, and *Elegia*, each 15. The average is reduced by the very large number of 204 genera, which are represented by only one species each; of these, 42 are monotypic genera.

It would be interesting to adduce data of other similar Floras for the sake of comparison with that of the Cape Peninsula. Strictly speaking these should be of peninsulas, or islands near a continent, of nearly equal area, and in the same latitude. Unfortunately no observations bearing any near approach to these conditions are here available. I can only subjoin a few which may be suggestive to the reader:—

	Square miles. about	Genera.	Species.
Tasmania	22,633	394	1,063
Natal	21,150	756	2,360
Sicily	9,860	619	2,549
Madeira	300	366	710
Cape Peninsula ...	197	485	2,117
Isle of Wight	155	376	867
Hong Kong	29	566	1,056
Ischia	18	389	792

REMARKABLE ABSENCE OF CERTAIN ORDERS.

It is not, however, merely by the vegetation actually present that the character of any particular Flora, as compared with others, is to be judged, but also by what is absent. In this respect that of the Cape Peninsula presents certain marked peculiarities.

In the first place it is a notable and somewhat unexpected circumstance that the large Orders MYRTACEÆ, APOCYNACEÆ, and ACANTHACEÆ are wholly absent—not a single species having been hitherto detected within our limits. Yet of the first there are 9 or 10, of the second probably over 30, and of the last 195 enumerated species, dispersed throughout extra-tropical South Africa. It is true that these are chiefly eastern in their distribution (only a few occurring in the south-western districts), and belong to what I have elsewhere termed the Sub-tropical Region; nevertheless it is remark-

able that not even a single outlier should have reached so far westward as the Cape Peninsula.

BIGNONIACEÆ and PEDALIACEÆ, less important Orders, yet both represented in the eastern and northern districts, are both entirely absent.

RUBIACEÆ, a vast Order, fifth in rank in the number of its species in the whole world, and the second in India, have but 15 species. Of these only two are trees; the rest small plants of the tribes Anthospermeæ and Galieæ. In Natal, however, this Order occupies a high rank, and probably reaches to about 3 per cent. of the whole Flora.

The following Orders also are very scantily represented here—those marked with an asterisk being also somewhat deficient throughout South Africa:—BIXACEÆ (2 species); MALVACEÆ (5); TILIACEÆ (1); SAPINDACEÆ (1); SAXIFRAGACEÆ* (1); ONAGRACEÆ* (1); CUCURBITACEÆ (2); PRIMULACEÆ* (2); CONVULVULACEÆ (3)—the genus *Ipomœa* entirely absent; CONIFERÆ* (2).

Of CYCADACEÆ, a few species, and of PALMACEÆ 2 species, reach their southern limits in the Sub-tropical Region, but both are wholly wanting here.

Of the ORCHIDACEÆ so numerous on the Peninsula, it is noteworthy that of the 117 species enumerated, 109, or 93 per cent., belong to the tribe Ophrydeæ; 7 species only to the tribe Vandææ; and 1 species to the Epidendreæ. All the species are terrestrial. Epiphytic orchids begin to appear only about the district of Knysna (in proceeding eastward) and become more abundant throughout the Sub-tropical Region.

RELATIONS OF THE PENINSULAR FLORA TO OTHERS.

A brief and very general statement only can be made on this subject. Even if space permitted, the data are as yet too incomplete to enable it to be treated as fully as its high importance demands. Excellent lists of the Flora of the Sub-tropical or South-eastern Region have been made by Mr. T. R. Sim for Kaffraria, and by Mr. Wood for Natal, which together give a satisfactory report of the Flora of that Region. But for that of the South-western Region a tabulated census is still wanting.

The general identity of the Peninsular Flora with that of the last-named Region has already been pointed out. On the eastern side there is a gradual transition (chiefly over the districts of Knysna, Humansdorp, and Uitenhage) to the Flora of the Sub-tropical Region. Some of the most striking contrasts between our Flora and

that of the latter have been mentioned in the foregoing pages. It must suffice now to show both certain resemblances as well as differences by a tabulated list of the chief constituents of each.

For a comparison of mere richness of species in proportion to area it must be remembered that the enumerations following afford little aid. Natal has an area of 21,150 square miles, or very nearly the size of the island of Tasmania; while, as before stated, the Cape Peninsula has but 197. We can therefore use them as an aid to comparison of the constituent elements of the Flora of each of two neighbouring Regions only; and from that point of view they possess, incomplete as they are, considerable interest. Natal is very much less fully explored than the Cape Peninsula, a large part being mountainous and difficult of access, and large additions to the records of the Flora may be expected for many years to come.

Mr. Wood's Catalogue, after deduction of Cryptogams, varieties and introduced species, shows a total of Orders, 123; genera, 756; species, 2,360. Of these, there are 38 Orders and 460 genera which have not been found on the Cape Peninsula; while there are 6 Orders and 195 genera belonging to the latter which are not in Mr. Wood's list.

The following is a list of the larger Orders of each Flora arranged according to the number of species, to which have been added for convenience' sake the chief twelve Orders of the Karoo Region which will be mentioned presently :—

Cape Peninsula.	Sub-tropical Region Natal (Wood).	Karoo Region (Eastern part).
1. Compositæ	1. Compositæ	1. Compositæ
2. Leguminosæ	2. Leguminosæ	2. Gramineæ
3. Iridaceæ	3. Filices	3. Ficoideæ
4. Orchidaceæ	4. Gramineæ	4. Liliaceæ
5. Cyperaceæ	5. Orchidaceæ	5. Crassulaceæ
6. Ericaceæ	6. Liliaceæ	6. Leguminosæ
7. Gramineæ	7. Asclepiadaceæ	7. Geraniaceæ
8. Ficoideæ	8. Cyperaceæ	8. Scrophulariaceæ
9. Restionaceæ	9. Rubiaceæ	9. Asclepiadaceæ
10. Liliaceæ	10. Scrophulariaceæ	10. Sterculiaceæ
11. Geraniaceæ	11. Labiataæ	11. Solanaceæ
12. Scrophulariaceæ	12. Euphorbiaceæ	12. Cyperaceæ
13. Campanulaceæ	13. Iridaceæ	
14. Proteaceæ	14. Amaryllidaceæ	
15. Filices	15. Acanthaceæ	
16. Crassulaceæ	16. Campanulaceæ	

Cape Peninsula.	Sub-tropical Region Natal (Wood).
17. Umbelliferæ	17. Malvaceæ
18. Rutaceæ	18. Crassulaceæ
19. Cruciferæ	19. Anacardiaceæ
20. Thymelæaceæ	20. Umbelliferæ
21. Polygalaceæ	21. Celastraceæ
22. Rosaceæ	22. Geraniaceæ
23. Amaryllidaceæ	23. Cucurbitaceæ
24. Selaginaceæ	24. Thymelæaceæ

If the following list of the twelve largest genera of the Natal Flora (which I take as fairly representative of that of the Sub-tropical Region), be compared with that of the Peninsula, it will be seen how considerably they differ:—

Peninsula.	Species.	Natal.	Species.
<i>Erica</i>	92	<i>Senecio</i>	58
<i>Mesembrianth'm</i> ...	61	<i>Helichrysum</i>	56
<i>Aspalathus</i>	50	<i>Indigofera</i>	42
<i>Disa</i>	47	<i>Cyperus</i>	36
<i>Senecio</i>	40	<i>Eulophia</i>	30
<i>Ficinia</i>	36	<i>Crassula</i>	28
<i>Oxalis</i>	32	<i>Rhus</i>	26
<i>Pelargonium</i>	30	<i>Gomphocarpus</i>	26
<i>Crassula</i>	29	<i>Panicum</i>	26
<i>Helichrysum</i>	29	<i>Ipomæa</i>	24
<i>Restio</i>	29	<i>Hibiscus</i>	21
<i>Gladiolus</i>	24	<i>Habenaria</i>	21

Three genera only are identical in the list. The following will serve to show still more vivid divergences. The first column shows certain genera predominant in the Flora of the Peninsula, but wholly wanting or much less numerous in Wood's Natal Catalogue; the second column shows predominant Natal genera similarly deficient in the Cape Peninsula—

	C. Penins.	Natal.		Natal.	C. Penins.
Erica.....	92	13	Helichrysum.....	56	29
Mesembrianth'm	61	7	Indigofera.....	42	16
Aspalathus	50	4	Cyperus.....	36	9
Ficinia	36	3	Eulophia	30	2
Oxalis	32	7	Asclepias (incl.		
Pelargonium.....	30	9	Gomphocarpus)	27	3

	C. Penins.	Natal.		Natal.	C. Penins.
Restio	29	0	Rhus	26	11
Cliffortia	23	3	Panicum	26	0
Heliophila	22	5	Ipomæa	24	0
Muraltia	18	2	Asplenium	22	5
Tetraria	17	1	Hibiscus	21	3
Agathosma	15	0	Habenaria	21	0
Serruria	15	0	Vitis	18	1
Gnidia	15	4	Vernonia	18	0
Elegia	15	0	Hypoxis	18	7
Ehrharta	14	2	Plectranthus ...	17	0
Geissorrhiza	11	0	Argyrolobium ...	15	4
Lachenalia	11	0	Andropogon	15	3
Felicia	10	3	Kniphofia	12	1
Protea	10	4	Polypodium	12	1
Lobostemon	9	0	Angræcum	11	0
Leucadendron ...	9	0	Combretum	8	0
			Polystachya	8	0

THE KARROO REGION.

With regard to the Karroo Region which bounds the South-western Region upon the whole of its northern and north-eastern sides, a few words must suffice. The relations between the two Regions are considerably slighter than those between the South-western and Sub-tropical Region. A list of the twelve largest Orders of the eastern part of the Karroo has been given on p. 225. This has been compiled from the records of Drège, and of my own collections made during several years' residence at Graaff Reinet. It will be seen by it that the large succulent Orders FICOIDEÆ and CRASSULACEÆ occupy a much more prominent position than on the Peninsula; and to this it may be added that the dry climate of the Karroo has resulted in a much more frequent tendency to a succulent growth of stems, branches, and leaves in several other Orders, such as ZYGOPHYLLACEÆ, COMPOSITÆ, and LILIACEÆ (tribe Aloineæ). This is not merely the case as to systematic characters, but it has also strongly characterised the floral landscape, both by the character of the plant-forms as well as by the number of the individual plants in proportion to others. The Order COMPOSITÆ, which on our Peninsula constitutes about 12 per cent. of the Flora, reaches in the Karroo Region to 17 per cent.; the FICOIDEÆ reach nearly 7 per cent.; the CRASSULACEÆ, 5·3.

On the other hand, the seven Orders RUTACEÆ, BRUNIACEÆ, ERICACEÆ, PROTEACEÆ, PENÆACEÆ, and ORCHIDACEÆ, which are

either so markedly predominant, or so essentially characteristic of the Peninsula Flora that they constitute together 19·55 per cent. of its species, are so rare that only seven or eight species in all have been recorded in the Karroo; and most of these occur sparingly on the summits of the mountains which separate the Karroo Region from the other Regions of South Africa.

EUROPEAN REPRESENTATIVES.

The evidences of the connection of our Flora with that of Europe are but slight. They consist in the presence of a small number of genera common to both. Amongst these may be named *Anemone*, *Ranunculus*, *Lepidium*, *Geranium*, *Erodium*, *Dianthus*, *Silene*, *Linum*, *Trifolium*, *Alchemilla*, *Rubus*, *Hydrocotyle*, &c. They are almost all small genera, only one, the last, reaching to 13 species. Some include European species as well as species regarded as native, such as *Trifolium*; others, as *Anemone* and *Geranium*, have native species only. It is one of the most marked features of South African vegetation that European genera are not, as a rule, found upon the higher mountain summits, where they might have been expected, the only exceptions I can recall being a few *Ranunculi* and two *Alchemillas* in the north-eastern districts, but the species were all undoubtedly native. The naturalised species of European origin are mostly weeds of cultivation and roadside plants, and few are seen far from houses.

The only sign of any affinity with the South American Flora consists in the presence of many species of the genus *Oxalis*, which are numerous in both countries.

AFFINITIES WITH THE AUSTRALIAN FLORA.

The relations of our Flora, and therefore that of the whole South-western Region, with that of Australia were first pointed out by Sir Joseph Hooker in his classical essay, "On the Flora of Australia. . . . An Introductory Essay to the Flora of Tasmania" (1859). They are very remarkable and curious. These affinities do not consist in the presence of identical species in either region; and scarcely even of genera common to both, for these are very few in number. But they are evidenced by the presence of certain identical, or closely related, Orders which are either peculiar to Australia and the South-western Region of South Africa or which there attain their maximum development.

"Two very distinct Orders—PROTEACEÆ and RESTIONACEÆ—are abundant in both regions, and, except for a few outliers, do not

occur in any other countries; yet they have no single species and only two or three genera, in common, out of many. . . . Diosmeæ, a large tribe of *RUTACEÆ* abundant in this Region, find a counterpart in Australia in the tribe *Boroniæ* of the same Order. The tribe *Ericæ*, of the Order *ERICACEÆ*, has over 400 species in this Region alone; not one occurs in Australia, but the place of the tribe is taken by the large Order *EPACRIDACEÆ*, very closely allied to it, and which is almost confined to Australasia."* There is no genus of *RUTACEÆ* or *PROTEACEÆ*, and only three of *RESTIONACEÆ*, common to both Regions. In *COMPOSITÆ*, Bentham has pointed out several identical genera which are abundant in South Africa, notably *Helipterum* with 12 South African and 30 Australian species, and *Helichrysum* with 137 and 52 species respectively.

"The following Orders, characteristic of Australian vegetation, abound most, after Australia, in South Africa: *THYMELÆACEÆ*, *HÆMODORACEÆ*, *DROSERACEÆ*; and another point of approach is found in the remarkable deficiency in both countries of the widely-diffused Orders *RUBIACEÆ*, *LAURACEÆ*, and *ARACEÆ*."

There are certainly some remarkable divergences, of Orders rare or absent in either country and represented in the other, which Hooker has specified in detail. To these may be added that whereas in the *ORCHIDACEÆ* of Australia it is the tribes *Vandæ* and *Neottieæ* which most largely prevail (*Ophrydeæ* being restricted to two species), in our Peninsular Flora the *Vandæ* are few, the *Neottieæ* absent, while *Ophrydeæ* abound. Still, these divergences do not destroy the striking significance of the affinities before mentioned.

Sir J. Hooker conjectures the probability of a common origin of the Australian and South African (*i.e.*, the South-west African) Floras, derived from ancestors inhabiting a vast antarctic continent of which the greater part has been submerged; and that during the ages which have succeeded the severance of the continents the two Floras have become differentiated as we now know them.† The evidence, it should be added, is not merely South African, but is corroborated by the spread of some of the Australian Orders mentioned above (*EPACRIDACEÆ*, *PROTEACEÆ*, *RESTIONACEÆ*) northward towards

* This and the following quotations are taken, for the sake of brevity, from my "Sketch of the Flora of South Africa" in the Official Handbook of the Cape of Good Hope, 1886; the substance being derived from Hooker's Essay, above-mentioned.

† More recent discoveries have tended, as far as they go, to support this hypothesis: the presence, on the mountain-tops of South-west Africa, of *Nanotirion*, a small *LILIACEÆ*, a close ally of *Herpolirion*, found in similar stations in S.E. Australia; and the facts and conclusions adduced in Mr. Clarke's paper on the Antarctic Origin of the tribe *Schœneæ*, cited above.

China, or north-westward to Patagonia and beyond, on the South American continent.

For a further and more detailed study of this deeply interesting subject the student is referred to the Essay of Sir J. Hooker, cited above.

THE EFFECTS OF BUSH FIRES ON THE VEGETATION.

In conclusion, some allusion may be made to the question whether any, and if so what, influence has been exercised upon the Flora of the Cape Peninsula and of South Africa generally by the widely-prevalent custom of burning the vegetation annually, in order, as it is said, that the young grass may grow more readily for the benefit of the live-stock. It may possibly be that this practice is of great antiquity; that it prevailed before the advent of Europeans; that it may have originated without the intervention of man, as from lightning or from heat produced by the impact of masses of falling rock during the dry seasons, causes which are said to be still in operation and to which the mountainous and precipitous character of the country lends an appearance of probability; that the results appearing beneficial, by the growth of more tender herbage, the aboriginal nomadic tribes imitated the processes of Nature, and produced artificial fires; and lastly that the early European colonists followed their example.

It has been observed here, as in other parts of the world, that the ground after a fire is often covered with a number of plants which had not been observed there previously, or at least for some considerable time, so as to appear (to a people who made no records of such facts), as if such plants were entirely new. Examples of such appearances are familiar to all South African observers, travellers, and collectors of plants, as well as of farmers; and vague ideas have been expressed that the great diversity of species exhibited here is due in part at least to the prevalence of bush fires.

This would probably be an erroneous supposition. The effect of burning would surely tend rather to destroy some species, especially annuals and hard-wooded plants, like heaths, which do not readily send up shoots from the caudex. It is noticeable that on mountain-sides where burning has been repeated plants with deeply-seated bulbs or rhizomes prevail to a considerable extent. Such are especially *Bobartia spathacea*, some *Watsonias* (*W. rosea*, &c.), and some of the stronger-growing *RESTIONACEÆ*. It is of course true that grasses and some other herbaceous plants fit for stock-food might more readily appear after burning in some localities,

but in others this is doubtful. Burning is most resorted to where the natural vegetation is largely composed of coarse grasses, **RESTIONACEÆ**, Iridaceous, Amaryllidaceous, and Liliaceous plants. These form the so-called "Zuurveld" or Sour-veld of the colonists; and in some cases it seems probable that more harm than good is done to the veld by burning it, since the Orders mentioned above, while they are all least suitable for stock-food, are at the same time most difficult to eradicate by burning.

The subject requires further investigation; but on the whole it appears to me probable that the practice of burning is more harmful than beneficial from the economic point of view, and that from a botanical point of view it tends to the destruction of species and the consequent greater uniformity, not necessarily to the greater usefulness, of the vegetation.

The Flora of the whole South-western Region is undoubtedly an ancient one, as compared, for instance, with the European Flora, and the view has been expressed that it is probably becoming slowly and gradually extinct. If this be so, it seems not unreasonable to suppose that the process is being accelerated by a custom which is of questionable benefit, and which at least should be brought to the careful judgment of science.