

SOUTH AFRICAN GRAMINEAE.

GRASSES OF THE TRANSVAAL AS REPRESENTED IN THE NATIONAL HERBARIUM.

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THE Transvaal may be divided broadly into three climatic areas each with various edaphic conditions and a corresponding flora. The South-Western and Western portion takes in part of the Karroo and the sand-veld of Bechuanaland. It consists of grass and low scrub with scattered thorn trees. The climate is generally hot and dry; the average rainfall is from 15 to 25 inches. The dominant grasses of this region are xerophytic species of *Eragrostis* (*E. Lehmanniana*, *E. Atherstonii*, *E. obtusa*, *E. echinochloidea*), *Sporobolus Ludwigii*, *S. tenellus*, *Aristida* spp., *Themeda triandra*, *Digitaria eriantha*, var. *stolonifera*, *Panicum coloratum*, *Brachiaria nigropedata*, *Antheophora pubescens*, *Fingerhuthia africana*, *Enneapogon* sp. and *Schmidtia* sp. The two latter are peculiarly characteristic of this region. Northwards to the Limpopo and eastwards, passing above the Magaliesberg, to the Drakensberg is the warm and moist tropical and sub-tropical region; a great part of this is bush veld with occasional stretches of open country developing into the savanna of the north. The annual rainfall of this region averages from 15–35 ins., except along the Drakensberg range, where it rises to over 70 inches. The tropical genera of the Andropogoneae are abundantly represented, the tall, coarse tambookie grasses and the sorghums, the dek-gras or thatching grasses, as well as many of the finer species. Broad-leaved species of the Paniceae are dominant in the bushveld area—*Panicum maximum* (Guinea grass), *Brachiaria brizantha*, *Digitaria* spp., *Setaria sulcata*, *Pennisetum cenchroides*, etc. The third region is what is known as the High Veld, which extends along the southern border, taking in parts of Potchefstroom, Heidelberg, and Standerton, and north as far as Middelburg and the Magaliesberg range. The winters in the High Veld are cold and dry, and it is subject to severe frosts; the average summer rainfall is from 25 to 35 inches. This region is practically all grass-veld, flat and treeless. *Panicum natalense* is plentiful. *Panicum laevifolium*, *Setaria nigrivestris*, *Themeda triandra*, *Eragrostis chalcantha*, *E. curvula*, *E. plana*, *Sporobolus indicus*, *Elionurus argenteus* (a widely distributed "sour" grass), *Koeleria cristata*, and *Cynodon dactylon* are among the dominant species.

For arrangement and numbering of genera in the following list, I have followed Dalla Torre and Harms in their *Genera Siphonogarum*. Where a genus has been created or revived since the publication of that work, it has been placed next to that to which it shows the closest affinity and given the same number with a distinguishing letter.

* Dr. Stapf's work on the *Gramineae* of Tropical Africa (Prain's Flora of Tropical Africa, Vol. IX), which is not yet complete, has been used, as far as possible, as a basis for nomenclature. No synonymy is given except in cases where the name given differs from that in the Flora Capensis; the synonym employed in this earlier work is then added in brackets. References to original descriptions are only given when the species is not described in the Flora Capensis.

* Dr. Stapf, in his recent and not yet completed work on the grasses of Tropical Africa, has revived a number of old genera and created a number of new ones. This paper is not the place for a critical review of this work, and I have, for present purposes, accepted it as a basis on which to build up my classifications, though I do not in all cases agree with Stapf's sub-divisions.

There is no doubt for instance that the genera *Andropogon* and *Panicum* as defined by him in his earlier work in the Flora Capensis were altogether too unwieldy, and contained a number of very heterogeneous types, but in splitting these up into separate entities he has, I think, gone to the other extreme and he has based some of his small genera on characters which I find to be inconstant or mutable, and often unimportant. This question will, however, be discussed in a later paper.

Local names are given where they are known. For the agricultural notes I am indebted to Mr. H. A. Melle, except where otherwise stated.

A revision of the South African species of the genus *Eragrostis* will be undertaken later. For the purposes of this present list the species not described in the Flora Capensis are identified by letters only.

Dr. J. Burt-Davy, for ten years prior to Union, Government Botanist and Agrostologist of the Transvaal, is responsible for the collection of the greater number of Transvaal grasses in the National Herbarium. *Eragrostis Burttdavii* was named in his honour. Mr. E. E. Galpin, formerly of Queenstown, but now of Mosdene, Naboomspruit, an enthusiastic collector, has of recent years contributed very considerably to our knowledge of the grasses of the Waterberg. The genus *Mosdenia* was so named after his farm, where it was collected; he has also been responsible for the collection of a number of new species, some of which bear his name.

Lastly, I make my acknowledgments to General J. C. Smuts, world-famous statesman and Prime Minister of the Union of South Africa, who finds time in his hours of ease (and he has not many of them) to interest himself in the study of botany as represented in the flora of South Africa. Being a farmer as well as a politician, he is most keenly interested in the grasses, and applies himself to stimulate and assist, in South Africa, more extensive research work on this most important order.

Digitaria Smutsii and *Sporobolus Smutsii* are named in his honour.

The localities recorded in the following list are, with few exceptions, from specimens in the National Herbarium of South Africa, all of which have been examined by me. The exceptions are indicated by an asterisk (*) after the number.

I have included in the key all the South African genera, instead of confining it only to those that occur in the Transvaal and narrowing the usefulness of the key to one Province.

The key to the species will be prepared later. At the present time there is such confusion between those of some of the larger genera that, until these have been revised, it is impossible to work out a satisfactory key to the species.

KEY TO THE GENERA OF SOUTH AFRICAN GRASSES.

1. Spikelets not or dorsally compressed, falling from the pedicels entire, never more than 2-flowered, perfect floret always uppermost 2
 Spikelets compressed laterally or scarcely compressed, 1-many flowered, glumes usually persistent or subpersistent on the rachis after the fall of the flower—or if the spikelets fall entire, then not consisting of 2 heteromorphous florets of which the lower is ♂ or barren 46
2. Valves and pales much more delicate in texture than the glumes, valves awned (except in *Urelytrum*, *Hemarthria*, *Elyonurus*, and *Imperata*) 3
 Valves similar in texture to the glumes or firmer, never entirely hyaline, occasionally mucronate, but seldom long awned. (In *Antheophora* the lower glume is rigidly coriaceous and longer than the valves, and in *Melinis* the barren valve is finely, sometimes long awned) 24
3. Spikelets in pairs at least in the upper part of the raceme, one sessile or shortly pedicelled and one on a longer pedicel 4
 Spikelets solitary, on filiform pedicels, arranged in lax racemes on the branches of a long narrow panicle XX. (¹) *Cleistachne*.
4. Spikelets of a raceme all alike in sex and form 5
 Spikelets differing in sex or form or both 9
5. Spikelets all pedicelled 6
 Spikelets one sessile and one pedicelled 8
6. Spikelets arranged in long solitary, binate or digitate racemes terminating the culms.
 VIII. *Trachypogon*.
 Spikelets racemosely arranged on the branches of a panicle 7
7. Panicle contracted, spike-like, dense, with long silvery-silky hairs; spikelets not awned I. *Imperata*.
 Panicle much branched, large, often somewhat contracted but not spike-like, greyish or tawny villous, spikelets awned II. *Miscanthidium*.
8. Racemes binate or digitate or subdigitate at the ends of the culms or the branches, villose with greyish or tawny hairs, spikelets awned III. *Eulalia*.
 Racemes solitary, terminating the culms and their branches, joints and pedicels fused, forming semi-cylindrical internodes, which are excavated on the inner face for the reception of the sessile spikelets. Spikelets not awned.
 VII. *Hemarthria*.
9. Racemes solitary (at least in the South African species), terminating the culms and their branches 10
 Racemes 2 or more 16
10. Racemes enclosed or partially enclosed in spathes 11
 Racemes not subtended by spathes 13

(¹) The numbers before the names refer to the order of the genera in the following list. Those without numbers have not been recorded within the limit of the Transvaal.

11. Lower glume of sessile spikelet with involute margins, not or obscurely keeled towards the apex..... 12

Lower glume of sessile spikelet with sharply inflexed margins ; 2-keeled, keels running into teeth or mucros. Racemes slender ; erect grasses usually tinged with red or brown. Much used for thatching.....XIV. **Schizachyrium**.

12. Racemes bearing 6-8 fertile, short-awned spikelets, almost entirely enclosed in the conspicuous brightly coloured, permanently cymbiform, spathes.

XVIII. **Monocymbium**.

Racemes much contracted, bearing 1 (rarely 2) fertile long-awned spikelet, the lower sessile florets approximating so as to form an involucre round the upper one.

"Rooigras".....XXI. **Themeda**.

13. Lower 3-10 pairs of spikelets homogamous, ♂, the sessile of the upper pairs ♀ or ♂, usually becoming dark brown, with a long hirsute twisted awn. "Speargrass."

IX. **Heteropogon**.

All pairs of spikelets heterogamous..... 14

14. Valve of fertile floret bilobed and awned. Lower glume of sessile spikelet bidentate with winged keels, pedicelled spikelets converging over the convex sides of the raceme. Raceme curved, spikelets up to 16 mm. long. Tropical grass.

V. **Sehima**.

Valves of fertile floret entire, not awned..... 15

15. Lower glume of pedicelled spikelet narrowed into a long squarrose awn, raceme long and rigid. A coarse sour grass.....VI. **Urelytrum**.

Lower glume of pedicelled spikelet not long awned, racemes delicate and silvery villous. Aromatic grass with narrow folded and usually flexuous leaves.

IX. **Elyonurus**.

16. Pedicelled spikelets ♀, racemes arranged in a densely ferruginous hirsute panicle.

Eriochrysis.

Pedicelled spikelets ♂ or neuter or suppressed..... 17

17. Racemes not subtended by a spathe..... 18

Racemes subtended by a spathe..... 22

18. Racemes digitate or subdigitate..... 19

Racemes panicled..... 21

19. Fertile valve bilobed, racemes binate, digitate, or fascicled, joints and pedicels cuneate, hollow and convex on the back.....IV. **Ischaemum**.

Fertile valve stipiform, joints and pedicels filiform..... 20

20. Joints and pedicels solid, racemes always with 1-2 homogamous pairs of spikelets at the base.....XIII. **Dicanthium**.

Joints and pedicels longitudinally grooved and hyaline in the groove, sometimes with the lowest pair of spikelets homogamous.....XII. **Amphilophis**.

21. Racemes reduce to three spikelets, one sessile, and two pedicelled which terminate the branches of the culms, trio falling together from the thickened bearded tips of the peduncles.....XI. **Chrysopogon**.

Racemes lax, few jointed, arranged on the branches of large usually open panicles

X. **Sorghum**.

22. Lower glume of sessile spikelet with sharply inflexed margins, 2-keeled..... 23
 Lower glume of sessile spikelet with involute and more or less rounded margins, awns
 hirsute, racemes binate on slender peduncles, subtended by a reddish spathe
 and collected into compound panicles.....XVII. **Hyparrhenia.**
23. Pairs of spikelets usually all heterogamous : racemes digitate or subdigitate, termin-
 ating the culm and its branches, peduncles usually long exerted from their
 narrow inrolled spathes.....XV. **Andropogon.**
- Lowest pair of spikelets on the lower raceme, or on both racemes, always homogamous-
 awns not hirsute ; racemes binate, partially enclosed, or not very long exerted
 from the reddish cymbiform spathe. Racemes collected into compound spatheate
 often dense and contracted, panicles. Mostly aromatic grasses.
 XVI. **Cymbopogon.**
24. Inflorescence of digitate, subdigitate, or racemously arranged spike-like racemes 25
 Inflorescence, an open, or contracted, or cylindrical, dense and spike-like panicle 37
25. Racemes very slender, digitate or subdigitate or less often whorled, or scattered
 on a long common axis ; spikelets muticous, nerves of the lower valve straight
 and parallel, margins of the upper valva flat and hyaline, lower glume minute
 or suppressed.....XXXV. **Digitaria.**
- Racemes digitate, or sub-digitate, or racemously arranged on a long common axis ;
 spikelets often mucronate, lower glume well developed, nerves of the valve and
 glumes curved, margins of upper valve firm and inrolled..... 26
26. Racemes digitate or subdigitate, nerves of the upper glume and lower valve 5, the
 outer nerves approximate and close to the margin ; upper valve mucronate ;
 upper glume and lower valve somewhat indurated ; keels of the lower glume
 sometimes fimbriate, winged ; spikelets 4-6 mm. long.. XXVIII. **Alloteropsis.**
- Racemes racemously arranged or paniced on an elongated common axis..... 27
27. Racemes very short (sometimes reduced to 1 spikelet), more or less sunk in the
 hollows on the face of a dorsally flattened, rather wide, common rachis. Creeping
 or prostrate perennial. The coarse couch grass of the Cape Province.
 Stenotaphrum.
- Racemes variously arranged on a more or less triquetrous, or terete, rarely flattened,
 narrow, common rachis..... 28
28. Lower glume of the spikelet very much reduced or quite suppressed..... 29
 Lower glume well developed, from less than half to equalling the spikelet..... 30
29. Lower glume reduced to a narrow membranous, or hyaline scale round the swollen
 bead-like lowest node of the spikelet.....XXX. **Eriochloa.**
- Lower glume usually quite suppressed, rarely a minute scale, lowest node of spikelet
 not swollen and bead-like, upper glume convex, lower valve flat.
 XXIX. **Paspalum.**
30. Spikelets with no definite orientation as regards the rachis..... 35
 Spikelets definitely orientated with regards to the rachis..... 31
31. Spikelets with the back of the fruiting valve towards the rachis (abaxial)..... 32
 Spikelets with the face of the fruiting valve towards the rachis (adaxial). Spikelets
 closely appressed, typically 2-seriate, sometimes becoming 1-seriate.
 XXXII. **Brachiaria.**

32. Upper valve obtuse, abruptly mucronate, or aristulate; glumes muticous, or cuspidate.....XXXI **Urochloa.**

Upper valve apiculate or obtuse; glumes often distinctly cuspidate, or, like the valves, with compressed callous tips..... 33

33. Fruiting floret gaping at the tip, owing to the slight recurving of the palea and valve..... 34

Upper valve embracing the palea all along, glumes and lower valve mucronate, or with distinct hirsute awns, that of the lower glume the longest.

XXXVIII. **Oplismenus.**

34. Glumes and valves with compressed callus tips or crests..... **Acroceras.**
Glumes and valves mucronate or shortly awned or at least cuspidate.

XXXIII. **Echinochloa.**

35. Spikelets not subtended by an involucre of one or more bristles, softly hairy.

Leucophrys.

Spikelets subtended by an involucre of bristles..... 36

36. Involucre usually reduced to 1 bristle; spikelets in long slenderly peduncled spike-like racemes, falling with the involucre. Glumes usually reduced to very small, delicate, nerveless, or 1-nerved scales.....XL. **Pennisetum.**

Spikelets arranged racemously or in fascicles, on the branches and branchlets of a narrow spreading or contracted panicle, often some of the spikelets without a subtending bristle, bristles always persistent, glumes herbaceous, nerved.

XXXIX. **Setaria.**

37. Inflorescence a more or less dense cylindrical spike-like panicle..... 38
Inflorescence an open or contracted panicle..... 42

38. Spikelets single or in clusters, subtended by 1 or more bristles, or surrounded by an involucre of spinous bracts, or with the outer glumes indurated and forming a spurious involucre..... 39

Spikelets not subtended by an involucre of any sort. Upper glume with a curved or gibbous or saccate back, lower valve similar, but with a flatter back, hence the spikelet more or less oblique in profile. Spikes usually very dense and dark coloured..... **Sacciolepis.**

39. Spikelets subtended by 1 or more bristles..... 40
Spikelets subtended by involucre formed of spinous bracts, or of the lower glumes 41

40. Bristles of the involucre persistent; glumes well developed and nerved; upper valve finely pitted or rugose and very convex.....XXXIX. **Setaria.**

Bristles of the involucre deciduous with the spikelets, glumes small, delicate, scale-like, often nerveless; upper valve more or less resembling the lower, smooth, and not strongly concave.....XL. **Pennisetum.**

41. Involucre composed of hard spinous bracts and deciduous with the enclosed cluster of spikelets, forming a spiny "burr".....**Cenchrus.**

Clusters of spikelets with the upper glumes turned towards the centre, the acuminate squarrose outer glumes contiguous at the base, and forming a spurious involucre round the deciduous cluster.....XXII. **Anthephora.**

42. Tips of upper glume and lower valve notched or bilobed, often with a fine awn; lower glume minute..... 43

Tips of glumes and valves entire, lower glume well developed (small and hyaline in *Sacciolepis*)..... 45

43. Upper glume and barren valve 5-nerved, nerves faint and anastomosing below the obtuse tips..... 44
 Upper glume 7-, barren valve 5-nerved, nerves prominent and not anastomosing below the acute tips, barren valve usually finely awned.....XXXVII. *Melinis*.
44. Upper glume and barren valve gibbous and long silky hairy....XXXVI. *Tricholaena*.
 Upper glume and barren valve not gibbous, glabrous, or at most shortly hairy.
 XXXVII. *Xyochlaena*.
45. Upper glume saccate (hence spikelets very gibbous), with 9-11 prominent rib-like nerves, lower glume small, hyaline.....*Sacciolepis*.
 Upper glume convex not gibbous, nerves not hardened and rib-like; lower valve equally convex, hence spikelet more or less symmetrical in profile.
 XXXIV. *Panicum*.
46. Leaf blades never transversely veined, in South African species, nor articulated on the sheath..... 47
 Blades transversely veined in South African species..... 139
47. Spikelets 1-flowered without barren valves or reduced florets above or below it (at least in South African species)..... 48
 Spikelets more than 1-flowered..... 69
48. Inflorescence an open, contracted, or more or less spike-like panicle 49
 Inflorescence of solitary, binate, or umbellate spikes..... 62
49. Spikelets disarticulating below the glumes and falling entire..... 50
 Spikelets disarticulating above the glumes..... 51
50. Spikelets in clusters or sometimes solitary in a dense cylindric spike-like panicle, the upper glume turned away from the rachis and with lines of short hooked spines on the prominent nerves.....XXIII. *Tragus*.
 Spikelets large, strongly laterally compressed, on the slender branches of an elongated spreading or contracted panicle, glumes scale or bristle-like. Valves strongly nerved.....XLII. *Oryza*.
51. Valves unawned..... 52
 Valves awned..... 55
52. Glumes well developed..... 53
 Glumes reduced to an obscure hyaline, entire or 2-lobed rim; valve 5-nerved subcartilaginous, keel and margins rigidly ciliate.....XLIII. *Leersia*.
53. Glumes equal or subequal, floret shorter than the glumes, spikelets light green 54
 Lower glumes usually smaller, often much smaller, than the upper, floret longer than the glumes, spikelets grey or greyish green, seldom gaping early.
 L. *Sporobolus*.
54. Glumes closely 3-nerved at the base, valve faintly 7-nerved, finely silky villous; pale subequal to the valve; ligule a fringe of hairs. A very delicate, much dwarfed perennial with a scanty lax panicle.....*Poagrostis*.
 Glumes 1-nerved, valve 3-nerved, glabrous or hairy (not silky), pale shorter than the valve, ligule membranous.....LI. *Agrostis*.
55. Awn from the back of the valve..... 56
 Awn from the tip or from just below..... 58

56. Callus small and long hairy, hairs usually exceeding the valve. Spikelets about 6 mm. long, straw coloured, shining, and crowded into a dense linear or linear oblong, spike-like panicle.....LII. **Calamagrostis**

Callus small, glabrous, or shortly hairy or minutely bearded..... 57

57. Glumes plumose, bristle tipped, panicle spike-like, compact, oblong, softly hairy
Lagurus.

Glumes glabrous, often scaberulous, not bristle tipped; panicle glabrous, spike-like, or open and lax.....LI. **Agrostis.**

58. Glumes awned; valve shorter than the glumes, very thin to hyaline; panicle contracted, spike-like, and plumose from the fine awns and bristles....**Polypogon.**

Glumes occasionally rather long mucronate, but never awned..... 59

59. Awn 3-branched or 3-partite (very rarely simple), ligule a fringe of hairs.

XLVII. Aristida.

Awn simple, ligules membranous..... 60

60. Awns rather coarse, kneeed and strongly twisted below the knee, floret cylindric or linear oblong.....**Stipa.**

Awn straight..... 61

61. Floret shorter than the glumes; valve convolute and more or less flattened from the back, 5-nerved, with minutely bilobed tips; awn from the sinus, caducous.

XLVIII. Oryzopsis.

Floret exserted from the glumes; valve involute and rounded from the back, 3-nerved and continuous with the awn.....**XLIX. Pseudobromus.**

62. Spikes solitary..... 63

Spikes binate or digitate..... 68

63. Glumes linear or linear lanceolate tipped by an awn, or subulate, or bristle-like 64

Glumes not awned..... 65

64. Spikelets in groups of 3 at the nodes of the rachis of a dense bristly spike, the two lateral ♂ or barren, the middle one ♀; valve herbaceous, chartaceous, awned.

Hordeum.

Spikelets very small, solitary, on the rachis of a slender spike, awns of glumes up to ten times as long as the glume, and usually capillary and purplish, valve smaller than the glumes and delicately hyaline.....**XXV. Perotis.**

65. Spikelets more or less immersed in the hollows of the rachis of a simple terminal spike, lower glume reduced or altogether suppressed..... 66

Spikelets not immersed in hollows, lower glume present..... 67

66. Upper glume 5-7-nerved, very rigid and acute; valve hyaline acute, glabrous, finely 3-nerved; callus obsolete.....**Lepturus.**

Upper glume 1-3-nerved, rigid except at the hyaline margins, valve hyaline, truncate or minutely 3-toothed, 3-nerved, and hairy along the nerves, callus bearded.

LXXXI. Oropetium

67. Spikelets arranged unilaterally on a flattened rachis, rachilla disarticulating above the glumes, which are persistent or deciduous.....**LVII. Michrochloa.**

Spikelets arranged singly on minutely tomentose notches in spirals round a ribbed and scabrid axis, from which they fall entire. Glumes subequal, lower boat-shaped and falcate.....**XXIV. Mosdenia.**

68. Mature spikelets tardily disarticulating below the glumes, valve 1-nerved. Spikelets 12-14 mm. long on a triquetrous excurrent rachis. Spikes 1-3, yellowish. Maritime grasses..... **Spartina.**
- Mature spikelets readily disarticulating above the glumes, the lower glume persistent. Valve 3-nerved, spikelets about 2 mm. long on a slender-keeled not excurrent, rachis. Spikes digitate or subdigitate.....LVIII. **Cynodon.**
69. Spikelets arranged in secund spikes or racemes..... 70
Spikelets in open or contracted or spiciform panicles, or in spikes or racemes, but not secund..... 84
70. Spikes solitary, terminating the culms..... 71
Spikes in umbels or variously arranged on a more or less elongated common axis 77
71. Valves awned..... 72
Valves not awned..... 73
72. Lower glume symmetrical, thin, keeled; upper glume 2-3-nerved with a stiff short awn from the middle; valve entire and awned just below the tip. Spikelets in dense unilateral, usually curved spikesLX. **Ctenium.**
- Lower glume inequilateral, one side dilated below the middle into a tooth, lobe, or wing. Upper glume entire, or notched below the mucronate or apiculate tip, but not awned. Valve 2-fid and awned from the sinus or 4-fid with the outer lobes awned. Spikelets rather remote on a slender furrowed rachis.
LXII. **Tripogon.**
73. Valves 7-nerved, navicular, finely tomentose in the lower half, with clavate hairs; spikelets 2, ranked.....**Brizopyrum.**
Valves 1-3-nerved..... 74
74. Valves minutely bilobed, spikelets 2-flowered, dorsally and obliquely compressed, glabrous, lower floret hermaphrodite.....LVII. **Michrochloa.**
Valves entire..... 75
75. Upper florets crowded in a club-shaped body not exceeding the hermaphrodite floret and enveloped by the valve of the lowest male floret; valves white and densely ciliate along the nerves.....LIX. **Harpechloa.**
Upper florets not as above..... 76
76. Spikelets in spike-like panicles that terminate the culms and their branches; glumes not awned, keels cartilaginous, muricate pectinate. Ligule a line of hairs.
Prionachne.
- Spikelets unilateral on short slender spreading or deflexed spikes that are racemously arranged on an elongated common axis. Glumes awned, smooth. Ligule membranous.....LXIII. **Dinebra.**
77. Spikes in umbels..... 78
Spikes arranged on a common axis..... 81
78. Valves awned..... 79
Valves not awned..... 80
79. Upper glume mucronate or more often with a curved awn, tips of the rachis barren and forming a sharp mucro.....LXV. **Dactyloctenium.**
- Upper glume obtuse or acute, and with a straight bristle or mucro, tips of the rachis not bare.....LXI. **Chloris.**

80. Glumes strongly keeled, 3-5-nerved, keel crested, spikelets greenish, 3-6-flowered. **LXIV. Eleusine.**

Glumes rounded or flat on the back, upper shortly and obtusely bilobed, spikelets brownish, 2-flowered.....**LXI. Eustachys.**

[=*Chloris petraea*, Thunb., in list.]

81. Spikes forming a compound spike..... 82
Spikes or racemes arranged on the branches of a panicle..... 83
82. Glumes and barren valves 1-nerved, fertile valves 5-nerved; styles very short.

Tetrachne.

Glumes 3-5-nerved, barren valves 6-8 nerved, fertile valves prominently 9-11-nerved; styles very long.....**Entplocamia.**

83. Valves rigidly membranous, acuminate, quite glabrous; panicles long and narrow with spreading, more or less curved, branches.....**LXXIII. Pogonarthria.**

Valves obtuse, with broad hyaline tips and finely silky side nerves; branches of the panicle few and erect.....**LXXIV. Diplachne.**

84. Ligule a fringe of hairs..... 85
Ligule membranous, scarious, or hyaline..... 105

85. Spikelets 2-flowered..... 86
Spikelets more than 2-flowered..... 93

86. Fertile valve awnless, sometimes with a bristle-like mucro..... 87
Fertile valves awned..... 89

87. Panicle open with fine branches and shining straw-coloured or purple-tinged spikelets, or if contracted into a spike-like panicle, then the lowest spikelets not consisting of a few empty glumes, and the valves not navicular with a submarginal line of hairs on each side.....**Achneria.**

Panicle densely spiciform..... 88

88. Spiciform panicle dense, compact, cylindric, never interrupted, greyish-green, often tinged with purple, usually from 2½-5 cm. long; spikelets strongly laterally compressed, lowest spikelets consisting of a few empty glumes; glumes long and softly or rigidly ciliate along the keels.....**LXXI. Fingerhuthia.**

Spiciform panicle smaller with fewer less strongly compressed spikelets, often much interrupted, no empty glumes at base of spike, glumes usually hispid with coarse tubercle based hairs.....**Lasiochloa.**

89. Lower floret awnless, ♂ or barren..... 90
Both florets perfect..... 92

90. Spikelets solitary on distinct pedicels..... 91
Spikelets in clusters of threes, rather large—up to over 1 inch long; valve of upper florets 2-lobed, with a coarse-kneed and twisted awn from the sinus

LV. Tristachya.

91. Spikelets small, never more than 5 mm., valve of upper floret 2-setose, minutely 2-toothed or entire, awn sometimes reduced or absent....**XXVI. Arundinella.**

Spikelets from 4 mm. to 3-25 cm., upper valve always distinctly 2-toothed or 2-lobed, awn always kneed.....**LVI. Tricopteryx.**

92. Ovary obovoid with a very dense, deciduous tomentum, consisting of branched hairs, at the top. Spikelets 14-24 mm. long.....**Pentameris.**

Ovary oblong, glabrous, spikelets 2-12 mm. long.....**Pentaschistis.**

93. Fertile valves lobed..... 94
Fertile valves entire or minutely lobed, notched or toothed..... 98

94. Fertile valves 2-lobed..... 95
 Fertile valves 4-9-lobed..... 97
95. Spikelets deciduous with the bearded upper part of the pedicel; rhachilla tough above the glumes, but readily disarticulating between the valves; awn from the sinus, kneed. Perennials, with flat soft leaves and narrow contracted panicle.
Chaetobromus.
 Spikelets disarticulating above the glumes and between the valves..... 96
96. Glumes not keeled, prominently nerved on the back, greenish with white hyaline margins; awn from the sinus of the 2-lobed valve, small and straight. Small annuals..... **Schismus.**
 Glumes keeled, often distinctly but not prominently nerved, usually straw-coloured and shining; awn usually kneed and twisted; hairs of the valve often gathered into tufts or lines. Perennial, seldom annual..... **Danthonia.**
97. Fertile floret 1; valve cleft into 9 subulate awn-like lobes..LXVIII. **Enneapogon.**
 Fertile florets, 3-5; valves cleft into four hyaline lobes, alternating with five straight awns from the sinuses.....LXIX. **Schmidtia.**
98. Fertile valves not awned..... 99
 Fertile valves awned..... 104
99. Valves 3-nerved..... 100
 Valves more than 3-nerved..... 102
100. Florets usually numerous and far exserted from the glumes; glumes and valves entire, awnless, side nerves of the latter distant from the middle nerve and often short; spikelets usually panicedLXXV. **Eragrostis.**
 Florets not, or shortly, exserted from the glumes; spikelets in a dense compact cylindric spike-like panicle..... 101
101. Spikelets jointed on and deciduous from the pedicels; glumes long and softly or rigidly ciliate; spikelets at the base of the panicle reduced to empty glumes.
 LXXI. **Fingerhuthia.**
 Spikelets disarticulating above the glumes and between the valves, purplish, and villous from soft grey hairs; no empty glumes at base of spike
 LXXVII. **Stiburus,**
102. Glumes 1-nerved.....LXXI. **Fingerhuthia.**
 Glumes 4-7-nerved..... 103
103. Spikelets 2-4-flowered, florets not exserted from the glumes; panicle spiciform, dense or sometimes with spiciform branches; spikelets mostly hispid from short coarse tubercle-based hairs.....**Lasiochloa.**
 Spikelets 4-9-flowered, florets distinctly, often far exserted from the glumes.
Brizopyrum.
104. Panicle ovoid, compact, very small, embraced at the base by the uppermost sheath, deciduous from the terminal node, culms 3-6 in. long.....**Urochlaena.**
 Panicle of subligitate spiciform branches; florets about 6, the lowest one or two ♂. the upper ones gradually reduced and embracing each other, forming a tuft of awns.....LXVI. **Lophacme.**
105. Spikelets always with 2 florets..... 106
 All or many of the spikelets with more than 2 florets..... 109
106. Spikelets of two kinds, the fertile surrounded by the sterile.....**Lamarkia.**
 Spikelets all alike..... 107

107. Spikelets sessile, imbricate in a dense cylindric spike.....**Secale.**
Spikelets in an open or contracted panicle..... 108
108. Spikelets disarticulating from the tips of the pedicels; glumes pectinate ciliate on the keels, the lower 1-, the upper 3-, nerved; panicle usually contracted, occasionally spike-like.....**LIII. Holcus.**
Spikelets disarticulating above the glumes and between the valves; glumes not pectinate ciliate on the keels, both 1-nerved; panicle delicate, open, with capillary branches.....**Aira.**
109. Valves 3-nerved..... 110
Valves more than 3-nerved..... 115
110. Lowest floret ♂ or barren, the rest ♀; spikelets enveloped by long hairs that spring from the long callus; panicle large, lax, and silky.....**LXXII. Phragmites.**
Lowest floret ♀, upper ♂ barren or reduced..... 111
111. Valves minutely toothed, or notched or occasionally entire, but not distinctly lobed 112
Valves lobed..... 114
112. Upper glume 3-nerved, lower 1- or 3-nerved.....**LXXVI. Koeleria.**
Upper and lower glumes 1-nerved..... 113
113. Valves truncate with 4 minute hyaline teeth, mid-nerve excurrent into a fine bristle, callus slender and acute.....**Leptocarydion.**
Valve 2-toothed or minutely notched or entire, callus very small or wanting.
LXXIV. Diplachne.
114. Valves shortly 2-lobed, side nerves not excurrent, callus small hairy; panicle spreading or contracted, with simple branches on which the subsessile or shortly pedicelled spikelets are appressed and rather far apart.....**LXVII. Crossotropis.**
Valves 3-lobed, the middle lobe more or less 2-fid and awned from the sinus, the side nerves also excurrent into fine awns; callus slender, acute, and bearded.
LXX. Triraphis.
115. Spikelets enveloped by long hairs that spring from the back of the valve; panicle large compound.....**LXXIIA. Arundo.**
Spikelets not enveloped by long hairs..... 116
116. Lowest florets of the spikelet ♂ or barren, or reduced..... 117
Florets all perfect or uppermost reduced (in *Cynosurus* this applies only to the terminal spikelets of the fascicle)..... 120
117. Lower valves much larger than the upper fertile valve..... 118
Lower empty valves reduced to minute scales..... 119
118. Lower male or barren valves awned from the back, membranous and equal. A sweet scented grass.....**XLVI. Anthoxanthum.**
Lower barren valves awnless or awned from the tip, cartilaginous..**XLIV. Ehrharta.**
119. Glumes reduced to minute scales or to an obscure, entire, or bilobed rim. A weak flaccid grass.....**XLI. Potamophila.**
Glumes large, enclosing the valves; leaves flat; panicle stiff and more or less spiciform.....**XLV. Phalaris.**
120. Lower 1-3 florets ♀, upper florets barren, embracing each other and forming a club-shaped or oblong body.....**Melica.**
Upper valves not forming a club-shaped body..... 121
121. Valves awned from the back..... 122
Valves awnless or awned from or near the tip or from the sinus..... 124

122. Ovary glabrous.....**Trisetum.**
 Top of ovary hairy..... 123
123. Spikelets large ; glumes rounded on the back, 7-11- nerved ; panicle larger and lax with pendulous spikelets.....**Avena.**
 Spikelets medium sized; glumes more or less keeled, 1-3- (rarely up to 7-) nerved ; narrow, stiff, erect panicle.....**LIV. Avenastrum.**
124. Valves awnless..... 125
 Valves awned from the tip or from the sinus..... 132
125. Valves closely imbricate, broadly boat-shaped, saccate, and scarious ; spikelets on long capillary pedicels.....**Briza.**
 Valves not broadly boat-shaped, or saccate and scarious..... 126
126. Spikelets sessile and solitary at the hollows of a simple spike..... 127
 Spikelets not sessile on a simple spike..... 130
127. Spikelets with their flattened side appressed to the rachis.....**Agropyrum.**
 Spikelets with their flattened side radial to the rachis.....**LXXX. Lolium.**
128. Styles lateral from the hairy 2-3-lobed appendage of the ovary...**LXXIX. Bromus.**
 Styles terminal or subterminal..... 129
129. Glumes and valves distinctly keeled, valves often with a tuft of long curled wool at the base.....**LXXVIII. Poa.**
 Glumes and valves rounded on the back or slightly keeled towards the tips, or glumes only keeled..... 130
130. Glumes and valves rounded on the back ; valves hyaline, variegated towards the tips, firm below, broad, obtuse.....**Atropis.**
 Glumes distinctly keeled, valves rounded or keeled towards the tips..... 131
131. Short annuals, with stiff panicles ; spikelets shortly pedicelled and more or less appressed to the short stiffly spreading branches ; valves oblong, obtuse ; ligules hyaline.....**Scleropoa.**
 Perennials with compound, usually open, flexuous, panicles (panicles reduced almost to a raceme in *F. vulpioides*) ; valves lanceolate, acute or subacute ; ligules scarious.....**Festuca.**
132. Valves with shining hyaline tips and margins ; awn very short ; panicle spike-like, cylindric.....**LXXVI. Koelaria.**
 Valves entirely herbaceous or chartaceous, or if with hyaline tips and margins, then not in a cylindric spiciform panicle..... 133
133. Ligules oblong-acute, up to 6 mm. long ; spikelets collected in compact, usually secund clusters, on a contracted or spiciform panicle.....**Dactylis.**
 Ligules rounded, truncate, or obtuse ; usually very short and often reduced to a membranous rim..... 134
134. Glumes of all, or at least of the lateral, spikelets very unequal, the lower glume minute or suppressed..... 135
 Glumes not very unequal..... 136
135. Spikelets on short club-shaped pedicels, the lower glume of all the spikelets minute or obsolete.....**Vulpia.**
 Spikelets sessile on a simple spike, lower glume of terminal floret equal or subequal to the upper.....**LXXX. Lolium.**
136. Ovary with an often large villous appendage, styles lateral from the appendage 138
 Ovary without a villous appendage..... 137

137. Spikelets of two kinds, the fertile surrounded by the sterile.....**Cynosurus.**
 Spikelets all alike.....**Festuca.**
138. Spikelets sessile in a simple raceme or false spike, with the flattened side to the axis.....**Brachypodium.**
 Spikelets pedicelled, in open or contracted panicle.....**LXXIX. Bromus.**
139. Spikelets monoecious; ♂ spikelets smaller than the ♀ on the lower branches of the panicle.....**Olyra.**
 Spikelets all alike ♀ 140
140. Stamens 3.....**Arundinaria.**
 Stamens 6.....**Bambusa.**

I. IMPERATA, Cyr (109).

Spikelets all alike, generally 2-nate (one short-, the other long-pedicelled) on the continuous branches (racemes) of a spike-like or narrowly thyrsiform panicle, disarticulating from the pedicels. Florets 2; the lower reduced to an empty valve (very rarely ♂?). Glumes sub-equal, membranous, 3-9-nerved, rarely nerveless, enveloped by very long silky hairs from the obscure callus and the lower portion of both glumes. Valve of the lower floret generally much smaller than the glumes, hyaline; of upper floret still smaller, hyaline, awnless, rarely 0. Valvule broad, hyaline, nerveless. Lodicules 0. Stamens 1-2. Styles connate below; stigmas linear, exserted from the top of the spikelet. Grain oblong; embryo half the length of the grain or more.

Perennial; basal leaves crowded and, like those of the innovation shoots, long; panicle silvery-silky.

I. arundinacea, Cyr., var. *Thunbergii*, Hack.

Pretoria: *A. O. D. Mogg* in *National Herb.* 39, *Burt-Davy* 828; Tzaneen, *Rogers* 12509; Warmbaths, Waterberg, *Stent*; Walven Kraal, Waterberg, *Pole Evans* 614.

A coarse grass with creeping underground stolons, common in vleis and on the banks of streams, widely distributed throughout South Africa, also in Tropical Africa; of no agricultural value.

II. MISCANTHIDIUM, Stapf (112).

Spikelets all alike, 2-nate, those of each pair unequally pedicelled on the articulate and tough or very tardily disarticulating rachis of paniced racemes, falling from their pedicels. Florets 2; lower reduced to an empty valve, upper always ♀. Glumes equal, chartaceous to coriaceous, lower dorsally flattened, more or less distinctly 2-keeled, with inflexed margins and a variable number of intracarinal nerves, upper 1-3-nerved, keeled. Valves hyaline, of the lower floret muticous or mucronate, of the upper awned; awn

perfect. Valvules small, hyaline, nerveless. Lodicules 2, cuneate. Stamens 3. Stigmas usually laterally exserted. Grain oblong to linear-oblong; embryo half the length of the grain.

Perennial, erect; blades long, narrow, midrib very stout or the whole blade terete (tropical African species); ligules membranous; panicle much-branched, often large, silky, and showy, spikelets usually villous, and with an involucre of hairs at the base.

M. junceum, Stapf (Stapf in Hook. Ic., Pl. XXXI, tab. 3084 = *Erianthus junceus* Stapf in Dyer, Flor. Cap., VII, 324).

Potgietersrust, Waterberg, *Burt-Davy* 2306; near Nylstroom, Waterberg, *Burt-Davy* 2000; Pyramid Estate, near Potgietersrust, Waterberg, *Galpin* 8873; Almans Drift, Bushveld, Pretoria District, *Pole Evans* 597.

A tall reed-like grass growing in vleis and on river banks.

III. EULALIA, Kunth. (113A).

Spikelets all alike, or nearly so, 2-nate, one sessile, the other pedicelled, on the articulate fragile rhachis of 2-nate, digitate or fascicled spike-like racemes, the pedicelled falling from their pedicels, the sessile deciduous together with the contiguous joint of the rhachis and the pedicel. Florets typically 2; lower reduced to an empty valve or represented by a minute scale or quite suppressed; upper always ♂. Glumes equal, rigidly membranous to coriaceous; lower dorsally flattened or shallowly concave (not grooved), more or less 2-keeled with inflexed margins; upper 1-3-nerved, keeled. Valves hyaline; lower muticous, sometimes much reduced or quite suppressed; upper very short, 2-lobed, awned. Valvules small or 0. Lodicules 2, small, cuneate. Stamens 3. Stigmas linear, laterally exserted. Grain oblong; embryo almost half the length of the grain or longer; hilum basal, punctiform.

Perennial. Culms simple, erect, or ascending. Leaf-blades convolute in bud, then flat, usually narrow, gradually passing into the sheath. Racemes often coloured (brown or purplish).

E. villosa, Nees. (Stapf in Prain, Flor. Trop. Afr., IX, 99 = *Pollinia villosa*, Spreng., Stapf in Dyer, Flor. Cap., VII, 325).

Waterval Boven, *Burt-Davy* 1437; Sterk Hill, Lydenburg, *Burt-Davy* 450.

E. geniculata, Stapf. (in Prain, Flor. Trop. Afr., IX, 101).

Mosdene, Naboomspruit, in moist places. *Galpin* 442.

A tropical grass.

IV. ISCHAEMUM, Linn. (119).

Spikelets of each pair alike, or differing only in sex, or more or less heteromorphous, one sessile or sub-sessile, the other pedicelled on the articulate fragile rhachis of 2-nate, digitate or fascicled, spike-like racemes, the pedicelled falling from their pedicels, the sessile deciduous together with the adjacent joint of the rhachis and the pedicel. Florets 2; lower generally ♂; upper ♀, rarely ♂ or neuter in the pedicelled spikelets. Sessile spikelet: glumes equal or sub-equal, lower dorsally flattened or somewhat convex and usually coriaceous below, chartaceous and markedly nerved upwards, rarely shallowly concave and more or less chartaceous throughout (§ *Coelischaeum*), more or less 2-keeled with inflexed margins; upper boat-shaped keeled at least above, sometimes awned. Valves rigidly membranous to hyaline, of lower floret muticous, of upper usually 2-fid and awned from the sinus, rarely mucronate or muticous. Valvules more or less equalling their valves, hyaline. Lodicules 2, cuneate. Stamens 3, sometimes smaller or rudimentary in the fertile flower. Stigmas linear-oblong, laterally exserted. Grain oblong or lanceolate, dorsally compressed; embryo reaching to the middle of the grain. Pedicelled spikelet in structure like the sessile, or more or less reduced, ♂ or neuter and awnless.



Plate I.

Ischaemum Mellei, Stent.

A, Pedicelled spikelet; B, Lower glume; C, Upper glume; D, Upper valve; E, Lower glume of sessile spikelet, back view; F, Lower glume of sessile spikelet, front view; G, Upper glume of sessile spikelet; H, Lower valve of sessile spikelet; I, Pale; J, Upper valve of sessile spikelet; K, Pale; L, Pistil and stamens

Generally perennial; blades convolute when young, at length flat; ligules generally membranous; racemes compressed, joints flattened or sub-concave on the inner side and often stout, sessile spikelets dorsally compressed, often rather broad, the pedicelled sometimes apparently laterally compressed with a median keel owing to the more or less complete suppression of one side.

I. arcuatum Stapf. (Prain, Flor. Trop. Afr., IX, 33 = *Ischaemum fasciculatum*, var. *arcuatum* Hook. ex Stapf. in Dyer, Flor. Cap., VII, 327).

Warmbaths, *Burt-Davy* 2339.

Also from Natal and Tropical Africa.

I. glaucostachyum, Stapf.

Strubens Farm, Pretoria, *Burt-Davy* 4482; Skinners Court, Pretoria, *Stent* H. 5173; Springbok Flats, Waterberg, *Burt-Davy* 1138; Rooikop, Bushveld, Pretoria District, *Pole Evans* 542, Nietverdiend; Zeerust, *Pole Evans* 329; Klip-drift, Marico District, *Pole Evans* 310.

A very glaucous grass with creeping underground stolons, good fodder for cattle, makes palatable hay, one of the best bushveld species. Commonly known as "turf-grass."

I. Mellei, Stent, n. sp.

Gramen perenne. *Culmi* erecti vel geniculati, ascendentes, simplices, vel ramis prope basim et aliquando e nodis superioribus, ad 120 cm. alti, glabri, tereti vel sub compressi. *Vaginae* foliorum laxae, striatae, tomentosae vel hirsutae, saepe longiores quam internodi, nodis albido-barbatis; *ligulae* membranaceae, truncatae, ciliatae, ad 2 mm. longae; *laminae* lineares ad 20 cm. longae, 12 mm. latae, planae, dense hirsutae, cum circa 5 nervis lateralibus latere costa utroque. *Racemi* 3, raro 2-4, 6-9 cm. longi, medii breviter pedunculati; articuli triquetri, 3-4 mm. longi, recti vel paulo curvati, purpurescentes, ciliati; pedicelli articuli aequales et sub paralleli, et apud junctionem non excisi. *Spicula sessilis* 8 mm. longa; *glumae* inaequales, maculis purpureis, superior paulo longior; inferior late ovato-lanceolata, basi contracta, epice paulo bifido, 5-9 nervis, dorso rotundo, longo hirsuto, apicem versus bi-carinata, lato-alataque; superior cymbiforma, acuminata, mucronata, 5 nervi, margines superiores atque carina angusto-alata ciliati. *Anthoecium inferum*: *valva* glumam sub-equalis, lanceolata, acuta, uno-nervata, membranacea, marginibus superioribus ciliatis, palea valvam sub-aequalis, carinis asperulis. *Anthoecium superum*: *valva* 5 nerva, ad medium bilobata; lobae ciliatae, arista circa 7 mm. longae; *palea* angusto-oblonga, fere valvam aequalis, carinis scabris, antherae 2-5 mm. longae. *Spicula pedicellata* 6 mm. longa; *gluma* inferior cymbiforma, lanceolata, acuminata, 11 nervis, dorso longe-hirsuta, carina apicem versus late alata; cetera similis spiculae sessilis sed *valva* superior haud profunde lobata.

Pastills Farm, Pretoria. *Melle* in *Nat. Herb.* H. 21423.

Very near to *I. purpurascens*, Stapf. (ex. descr.), from which it differs in being larger in all its parts and very hairy, the joints and pedicels not being excised, and in the broadly winged keels of the lower glumes.

A very early vlei grass, very palatable to stock, but not frost resistant.

V. SEHIMA, Forsk. (119A).

Spikelets 2-nate, those of each pair differing in sex and (in the African species) also much in shape, one sessile, the other pedicelled on the articulate fragile rachis of solitary spike-like racemes, the pedicelled tardily separating from their pedicels, the sessile deciduous together with the adjacent joint of the rachis and the pedicel. Florets 2; lower ♂, upper ♀ in the sessile, ♂ or neuter in the pedicelled spikelets. Sessile spikelets: Glumes equal or sub-equal; lower deeply grooved, rarely flat, 2-dentate or 2-mucronate, more or less chartaceous, upwards acutely 2-keeled with inflexed margins, keels winged; upper glume boat-shaped, keeled upwards with a bristle-like awn. Valves hyaline, of lower floret entire, muticous, of upper 2-fid and awned from the sinus. Valvules more or less

equalling their valves, hyaline. Lodicules 2, cuneate. Stamens 3. Stigmas linear-oblong, laterally exserted. Grain oblong, obtusely trigonous; embryo reaching to the middle of the grain. Pedicelled spikelets flat, with (in the African species) a strongly nerved or ribbed lower glume, and 2 florets resembling the lower floret of the sessile spikelets, the lower or both more or less reduced and barren.

Perennial or annual; blades convolute when young, at length flat, narrow; ligules a line of stiff hairs; racemes usually gently curved, dorsiventral and laterally compressed, with the pedicelled spikelets converging over the convex side, joints and pedicels sublinear and parallel; sessile and pedicel spikelets strikingly heteromorphous in the African species.

S. galpinii, Stent, n. sp.

Gramen perenne. *Culmi* erecti, ad 1.5 m. alti, teretes, laeves, glabri, simplices, 2-4 nodi, internodi superiores, longissimi, exserti. *Folia* glauca; vaginae tenuite, sulcatae, laeves, glabrae vel nonnunquam nodi inferiores tomentosae; superiores aliquantum arctae, inferiores confertae fere flabellatae; *ligulae* ovatae, setis rigidis 2 mm. longis constitae; *laminae* anguste lineares, circa 4 mm. latae, 15-30 cm. longae, longe in apicem setaceum attenuatae, planae, glabrae, scaberrulae, marginibus albis scabris cartilaginibus; costa gracilis, supra albida, 4-5 nervis lateralibus costae utrimque. *Racemus* solitarius, ad 19 cm. longus, strictus vel aliquantum curvus; articuli pedicellique paralleli, 7 mm. longi, subcompressi vel tenuite concavi, glabri nitensque, dense albo ciliatos margines. *Spicula* sessilis 15 mm. longa, subfalcata; *glumae* aequales; *inferior* praete apicem membranaceum chartacea, subfalcata, cum 9 nervibus inaequalis et cum transversis saepe brachiatis in parte superiore venulis, admodum carinata, carina exterior ala angusta ciliata et margine latiore inflexo, interior et exterior scabrida, dorsus flavus viridis nervibus carinisque; *superior* navicularis, chartacea, nitens, laevis, marginibus longe ciliatis, 5 nervis cum venulis transversis, apice carinata, carina ala ciliata, in setam longam excurrente. *Anthoecium inferum* ♂: *valva* 11 mm. longa, minute biloba, hyalina, 2 nervis, apicem versus scabridis, marginibus inflexis; *palea* similis valvae sed rigidior et omnino scabrida; *Antherae* 3, 6 mm. longae; *lodiculae* cuneatae, carnosae, 1 mm. longae. *Anthoecium superum* ♀: *valva* 3 mm. longa, biloba, 3 nervis, parte inferiore hyalina, margines ciliatis; *arista* 40 mm. longa, columna bruneo-fulva, marginibus involutibus minutissime ciliatis; *palea* valvam equalis, acuminata, minute biloba; *antherae* et lodiculae iis in anthoecio infero similis; *stylis* compressi, distincti; *caryopsis* trigona, urceolata. *Spiculae* pedicellatae 15 mm. longae: gluma inferior subfalcata, flavia, purpureo-tincta, 7 nervis, intercarinas cum venulis transversis, nervi carinaeque viridi; *gluma* superior inferiorem subaequalis, sub-cymbiforma, membranacea, scabrida, 3 nervis, marginibus hyalinis, ciliatis; *anthoecia* 2, ♂; *valva* inferior, gracilis, membranacea, ciliata, minute bidentata, 3 nervis, nerva media in punctam callosum deltoideam excurrente; *palea* linearis, 2 nervis; *anthoecium superum* anthoecii inferi in spicula sessile simile.

Geluk, Springbok Flats, Waterberg, *Galpin* M. 557.

This comes nearest to the Indian species, *S. notata*, but has much larger spikelets. The flat lower glume of the sessile spikelet without a depressed channel on the median line separates it from other known African species, none of which are recorded so far south.

Mr. Galpin says of this grass: "In addition to growing on the farms Geluk and Zaai-plaats, there are also large patches of it growing on the adjoining farms Zandfontein Oog and Welbekend. . . . It is an excellent thatching grass, the culms being stout and very free from leaves, but it is not eaten by stock."

VI. URELYTRUM, Hack. (125).

Spikelets 2-nate, those of each pair different in shape and sex, one sessile, the other pedicelled, on the very fragile rhachis of solitary, paired, or racemed subcylindric spike-like racemes, the sessile deciduous with the adjacent joint of the rhachis and pedicel; joints obliquely truncate with appendaged tips. Sessile spikelets; florets 2, lower ♂

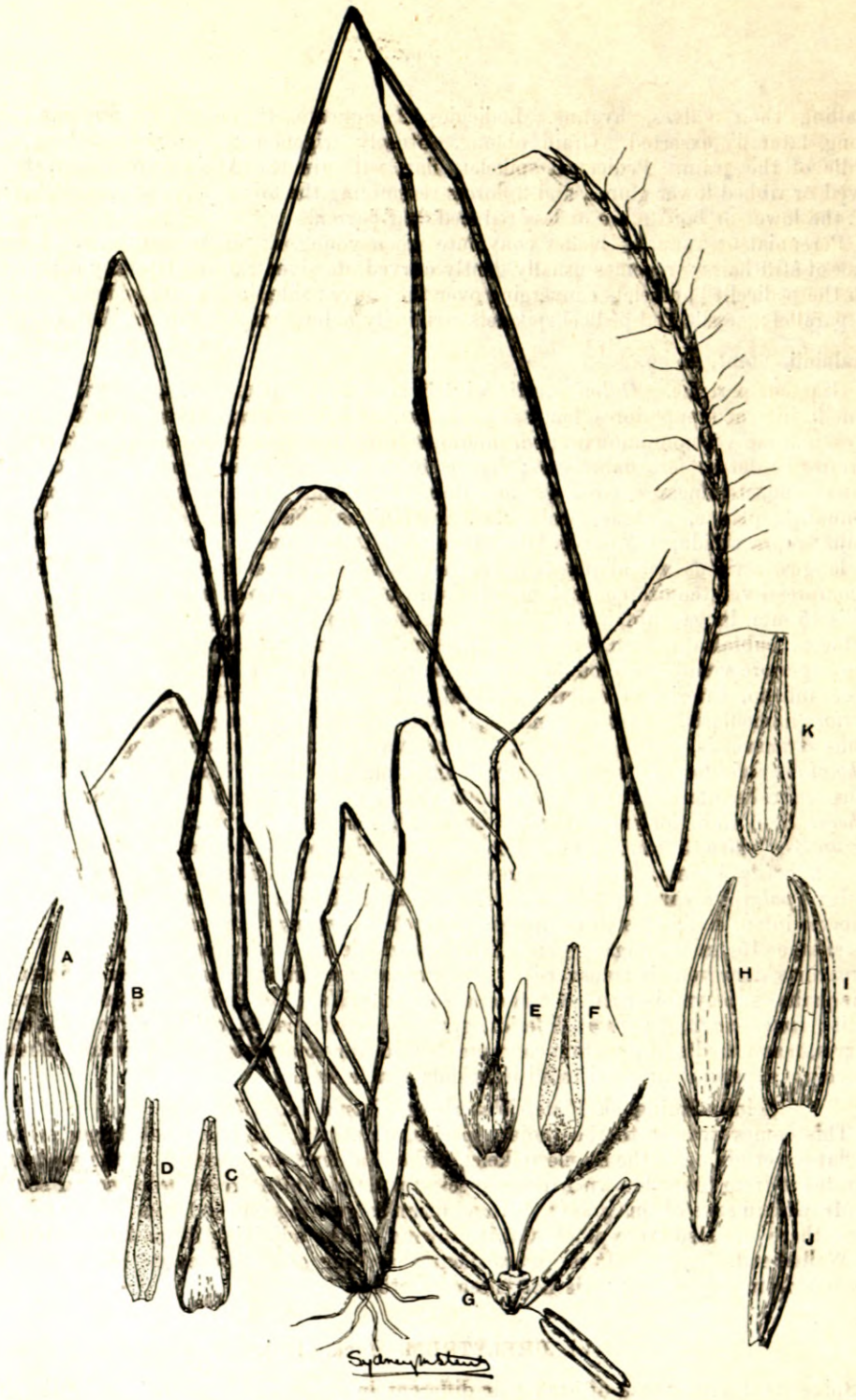


Plate II.

Sehima Galpinii, Stent.

A, Lower glume of sessile spikelet; B, Upper glume of sessile spikelet; C, Lower valve of sessile spikelet; D, Pale; E, Upper valve of sessile spikelet; F, Pale; G, Pistil and stamens; H, Pedicelled spikelet; I, Lower glume, front view; J, Upper glume; K, Lower valve.

upper 8. Glumes equal or subequal; lower coriaceous, dorsally flattened, 2-keeled, muticous; upper subchartaceous or membranous, boat-shaped, keeled. Valves hyaline, subequal, slightly shorter than the glumes, muticous, of lower floret 2-, of upper 3- to sub-5-nerved. Valvules almost equalling their valves, hyaline, 2-nerved. Lodicules 2, cuneate. Stamens 3. Stigmas linear, laterally exserted. Grain narrow, oblong, terete at the middle; scutellum to the middle; hilum obovate, basal. Pedicelled spikelets with 2 ♂ florets and with the lower glume narrowed into a subulate often long awn, otherwise as in the sessile spikelets, or more or less reduced, sometimes to a pair of rudimentary glumes, the lower of which is represented by a long awn, flattened and widened at the base.

Perennial, rarely annual; culms erect, few-noded, simple; blades narrow, linear, flat or convolute; racemes long, rigid.

U. squarrosus, Hack.

Paardevalle No. 12, near Zeerust, *Burt-Davy* 7196; Observatory Ridge, Johannesburg, *Burt-Davy* 3098; Houghton Estate, Johannesburg, *Bryant* C. 16.

A coarse sour grass.

VII. HEMARTHRIA, R.Br. (127A).

Spikelets 2-nate on the tough or tardily disarticulating rhachis of spike-like spathe-supported racemes which terminate the culms and their often fascicled branches, alike in sex and shape, or at least similar; joints and pedicels fused into roughly semicylindric internodes, hollowed out on the inner face for the reception of the sessile spikelet; disarticulation at a right angle to the rhachis or slightly oblique, tips of joints truncate, not hollowed out or appendaged. Sessile spikelet: florets 2, lower reduced to a barren valve, upper 8, awnless. Glumes equal or subequal, lower flat on the back, 2-keeled, very narrowly inflexed along the margins, coriaceous or subcoriaceous, closing up the cavity formed by the adjacent joint and pedicel, upper membranous adhering to the inner face of the cavity. Valves hyaline, of lower floret 2-nerved, of upper usually nerveless. Valvule (of upper floret) hyaline, small, nerveless. Lodicules 2, cuneate. Stamens 3. Stigmas laterally exserted. Grain oblong, dorsally slightly compressed; embryo about two-thirds the length of the grain; hilum conspicuous, punctiform, subbasal. Pedicelled spikelet with more elongated acuminate glumes, particularly the terminal, the upper glume mucronate or aristate.

Decumbent or ascending perennial grasses with many-noded branched compound culms; blades linear, conduplicate in bud, then flat; ligules very short, membranous; racemes compressed, often curved, tips more or less subulate owing to the slender terminal spikelet; spikelets pseudo-opposite owing to the fusion of joints and pedicels, each pair made up of a sessile (secondary) spikelet and the pedicelled companion of the sessile spikelet of the next lower node.

H. fasciculata, Stapf (Prain, *Flor. Trop. Afr.*, IX, 55 = *Rottboellia compressa*, var. *fasciculata*, Hack. ex Stapf in Dyer, *Flor. Cap.*, VIII, 329).

Irene, near Pretoria, *Burt-Davy* 3843, *Pole Evans* 366; Christiana, Bloemhof, *Burt-Davy* 11706; Waterval Boven, *Burt-Davy* 1409; Leeuwpoot, Carolina, *Burt-Davy* 112; Almans Drift, Bushveld, Pretoria District, *Pole Evans* 596.

A common species of vleis and streams usually semiprostrate, with creeping base. Found throughout Africa, moderately frost-resistant. Well liked by cattle.

VIII. TRACHYPOGON, Nees. (131).

Spikelets 2-nate, those of each pair differing in sex and slightly in shape, both pedicelled on the tough or upwards very tardily disarticulating many-jointed rhachis of solitary, 2-nate, or digitate racemes, terminating the culms; pedicels unequal (the lower very short), fused towards the base with each other and the adjacent internode of the rhachis, this and the pedicels terete or subterete, the longer of the latter disarticulating very obliquely;

internodes marked off by very oblique and usually shortly bearded articulation lines; subsessile spikelets persistent; long-pedicelled spikelets falling separately. Florets 2, lower reduced to an empty valve, upper ♂ or neuter in the subsessile, ♀ in the upper long-pedicelled spikelet. Fertile (upper) spikelets more or less terete, awned; callus acute to very pungent, densely bearded. Glumes equal or subequal; the lower firmly chartaceous to coriaceous, subconvolute, finely 2-keeled upwards, the inflexed margins very narrow or reduced to a mere rim, nerves 5-9 in addition to the keel-nerves, mostly obscure except in transmitted light, more or less connected by transverse veins in the upper part; upper thinner, 3-nerved, grooved on either side of the rounded keel. Valve of lower floret hyaline, 2-nerved, ciliate or ciliolate upwards, of upper floret stipitiform, hyaline and 3-nerved at the base, cartilaginous upwards and passing into a flexuous or geniculate awn. Valvule very small, hyaline or 0. Lodicules 2, small, glabrous. Stamens 3. Stigmas laterally exserted; styles terminal. Grain terete; embryo about half the length of the grain. Male or neuter (lower) spikelets dorsally flattened (particularly the lower of a raceme) or more or less terete, awnless; callus 0. Glume and valve of the lower floret similar to those of the fertile spikelets. Valve of the upper floret narrow, hyaline, entire or 2-toothed, with or without a minute mucro, rarely produced into a short bristle. Stamens 3. Pistil, if present, rudimentary.

Perennial (very rarely annual?), densely caespitose grasses, with more or less slender wiry culms conspicuously bearded below the nodes; the beards appressed, covering the constricted nodes; leaf-blades narrow, frequently convolute.

T. plumosus, Nees. (*ex* Stapf in Prain, *Flor. Trop. Afr.*, IX, 403=*T. polymorphus*, var. *capensis*, Hack. *ex* Stapf in Dyer, *Flor. Cap.*, VII, 331).

Henley-on-Klip, *Stent* in *Nat. Herb.*, H. 21144; Groenkloof, Pretoria, *Phillips*, H. 21683; Johannesburg, on steep hillsides, *Bryant* D. 22; near Shilovane, Zoutpansberg, *Junod* 4077; Ermelo, *Burt-Davy* 5471; Leeuwpoot, Carol na, *Burt-Davy* 7343; Sterk Hill, Lydenburg, *Burt-Davy* 476.

Fairly widely distributed through the tropical and subtropical regions of the world.

A coarse grass only palatable when young; tested as a material for paper-making at the Imperial Institute, it was found to yield good pulp, but the ultimate fibres were rather short; good thatching grass.

IX. **ELYONURUS**, Humb. and Bonpl. (132).

Spikelets similar, usually awnless, but differing in sex, 2-nate, one sessile, the other pedicelled, on the articulate fragile rhachis of solitary spike-like racemes, the sessile deciduous with the adjacent joint of the rhachis and the pedicel. Florets 2; lower reduced to an empty valve; upper ♀ in the sessile, ♂, rarely barren, in the pedicelled spikelet. Glumes equal; lower subcoriaceous to herbaceous, often 2-toothed or 2-fid, rarely awned, dorsally flattened, 2-keeled, usually with fine filiform transparent balsam ducts close to the ciliate or penicillate keels; upper membranous, lanceolate, acute, rarely awned. Valves hyaline, awnless. Valvule obsolete or 0. Lodicules 2, cuneate. Stamens 3. Stigmas laterally exserted. Grain oblong, dorsally compressed; embryo about half the length of the grain.

Generally perennial, caespitose, aromatic; blades flat or folded; ligules membranous, very short; racemes erect, joints strongly compressed, usually villous, tips oblique, not appendaged.

E. argenteus, Nees.

Eloffs Plantation, Pretoria, *MacDonald* in *Nat. Herb.* 118; Derby Station, Marico, *Burt-Davy* 7168; Mosdene, Naboomspruit, Waterberg, *Galpin* M. 410; Meintjes Kop, Pretoria, *Lansdell* in *Nat. Herb.* 65; Henley-on-Klip, *Stent*, *Nat. Herb.* H. 21138; Potchefstroom, *Burt-Davy* 14569; Ermelo, *Burt-Davy* 952; Bloemhof, *Burt-Davy* 12953; Malans Farm, Hartbeestnek, *Burt-Davy* 758.

Widely spread throughout South Africa as well as in the tropics. A xerophytic grass of little value, usually characteristic of sour veld, known locally as "Wildebeeste gras," and "Zuur pol." Occasionally useful for winter grazing.

X. SORGHUM, Pers. (134A).

Spikelets 2-nate, those of each pair differing in shape and sex, one sessile, the other pedicelled or represented by a pedicel only, on the articulate fragile or (in cultivated forms) tough rachis of panicle few- (sometimes 1- or, the other extreme, 6-8-) jointed racemes, the sessile spikelet falling with the contiguous joint and the accompanying pedicelled spikelet or at least its pedicel. Florets 2, lower reduced to an empty valve, upper ♀ in the sessile, ♂ or neuter in the pedicelled spikelets, if present at all. Sessile spikelets dorsally compressed. Glumes equal, coriaceous, at least when mature, rarely permanently chartaceous, muticous, lower with a broad flattened or convex back with the margins narrowly inflexed near the tips and otherwise involute, upper boat-shaped, keeled upwards with narrow hyaline, usually upwards ciliate margins. Valves hyaline, ciliate, of lower floret 2-nerved or nerveless, of upper oblong to ovate, 2-dentate or 2-lobed, with the lobes free or more or less adnate to a perfect or variously reduced awn or a mucro rising from the sinus, rarely entire and mucronate or muticous, 1- or 3-nerved. Lodicules 2, ciliate or glabrous. Valvule hyaline, often minute or 0. Stamens 3. Stigmas laterally exserted; styles terminal or sub-terminal. Grain in the spontaneous species mostly obovoid, dorsally compressed, in cultivated forms frequently enlarged, globose or sub-globose; embryo as long as or slightly longer than half the grain. Pedicelled spikelets, if present, much narrower than the sessile, lanceolate to subulate, ♂ or neuter, sometimes reduced to the glumes or one glume only, or quite suppressed. Glumes permanently herbaceous, like the hyaline 2-1-nerved ciliate; valves awnless.

Annual or perennial, often robust, grasses. Leaf-blades convolute in bud, usually flat, herbaceous, often large. Panicles erect or nodding, with verticillate or scattered branches, often large, in the spontaneous species mostly loose, in the cultivated forms frequently variously contracted to compact.

S. halepense, Nees. (Flor. Afr. Austr., 88=*Andropogon halepensis*, var. *effusus*, Stapf in Dyer, Flor. Cap., VII, 346).

Springbok Flats, Waterberg, *Burt-Davy* 1128; Mountain View, Pretoria, *Wagstaff* in *Nat. Herb.* H. 162; Skinners Court, Pretoria, *Native Aaron*, *Nat. Herb.* H. 109; Johannesburg, *Nat. Herb.* H. 108; Groot Marico, *Burt-Davy* 121; Barberton, *Burt-Davy* 248.

This is the stoloniferous *Sorghum* known in America as Johnson grass. Stapf has followed Piper in doubting the existence of this grass as indigenous to tropical Africa and has omitted it from his Flora of that region. It certainly occurs spontaneously in subtropical parts of the Transvaal, mostly along streams. It is possible that in some localities from which it has been recorded as a troublesome weed, the seed has been introduced as an impurity probably with Sudan grass seed, but in other localities there appears little doubt that it occurs naturally indigenous to the soil. As in the case of most of the other species of *Sorghum*, it contains a certain amount of prussic acid.

S. versicolor, J. N. Anders (ex Stapf in Prain, Flor. Trop. Afr., IX, 138).

Mosdene, Naboomspruit, *Galpin* M. 419; Wonderboompoort, Pretoria, *Mogg* in *Nat. Herb.* 182; Potgietersrust, Waterberg, *H. M. Dewar* in *Nat. Herb.* H. 20947; Onderstepoort, Pretoria, *Native Aaron* in *Nat. Herb.* H. 183; Pyramids, near Pretoria, *Burt-Davy* 4480.

Plentiful in the Rustenburg and Waterberg districts, sometimes behaving as an annual or at least flowering the first year. "Only found on black turf; much liked by stock and cut for fodder by some farmers."—*Galpin*.

S. ethiopicum, Rupr. (ex Stapf in Prain, Flor. Trop. Afr., IX, 119).

Zeerust, in *Nat. Herb.* H. 21416.

S. micratherum, Stapf (l.e. 142).

Mosdene, Naboomspruit, Waterberg District, *Galpin* M. 413; Tzaneen, Zoutpansberg, *Sampson* in *Nat. Herb.* H. 4402.

XI. **CHRYSOPOGON**, Trin. (134e).

Spikelets in threes at the ends of the branchlets of terminal panicles, one sessile, the other 2 pedicelled, the trio falling entire from the thickened, nearly always bearded, oblique tips of the peduncles; exceptionally 2-nate in 2-jointed racemes, one sessile, the other pedicelled, each sessile spikelet falling with the contiguous joint and its pedicelled companion, pedicels (and joints, where any) linear-filiform, never longitudinally grooved not appendaged. Florets 2; lower reduced to an empty valve, upper ♀ in the sessile, ♂ or neuter in the pedicelled spikelet. Sessile spikelets usually laterally compressed, awned. Glumes subequal; lower coriaceous or chartaceous, involute with a rounded back or complicate and more or less keeled upwards, upper boat-shaped, more or less keeled. Valves hyaline, of lower floret 2-nerved, of upper linear, entire or 2-dentate with a usually perfect awn from the sinus. Valvule 0 or small, hyaline, nerveless. Lodicules 2, small, glabrous. Stamens 3. Stigmas exerted laterally low down. Grain linear, laterally compressed; embryo half the length of the grain; scutellum linear-oblong. Pedicelled spikelet dorsally compressed, awnless or aristulate.

Mostly perennial (all the Old World species). Leaf-blades narrow. Panicles usually lax, of whorls of simple or basally divided filiform branches, rarely the branches 2-nate or solitary.

C. montanus, Trin., var. *tremulus*, Stapf (= *Andropogon monticola*, var. *trinitii*, Stapf Dyer, Flor. Cap., VII, 349).

Warmbaths, Waterberg District, *Burt-Davy* 2338.

XII. **AMPHILOPHIS**, Nash (134c).

Spikelets 2-nate, one sessile, the other pedicelled, similar in shape or the pedicelled reduced and smaller, the latter always different in sex, except sometimes the lowermost pair, which may be homogamous (♂ or neuter), on the fragile rhachis of many-jointed shortly peduncled subdigitate or paniced racemes; joints and pedicels filiform, longitudinally grooved and hyaline in the groove, disarticulating horizontally sessile and pedicelled (always ?) spikelets deciduous, the former with the adjacent joint and pedicel. Florets 2 in the sessile spikelets; lower reduced to an empty valve, upper ♀, 2 or 1 in the pedicelled spikelet, the lower ♂ or neuter, the upper neuter or usually quite suppressed. Sessile spikelet dorsally compressed, awned; callus small, shortly bearded. Glumes equal, thinly chartaceous to membranous; lower 2-keeled, with narrow sharply inflexed margins; upper boat-shaped, 3-nerved, acutely keeled. Valve of lower floret hyaline, nerveless, of upper floret reduced to a hyaline linear stipe, firmer upwards, passing into a slender awn. Valvules 0 or very minute. Lodicules 2, minute, glabrous. Stamens 3. Stigmas exerted laterally, usually low down, longer than the styles. Grain oblong, obtuse, dorsally slightly compressed; embryo about half the length of the grain. Pedicelled spikelet awnless, valves (if present) hyaline, nerveless.

Perennial grasses with slender simple or branched culms, bearded or beardless at the nodes. Panicles mostly subdigitate with a short primary axis, rarely the racemes on branches of the second order; racemes always shortly peduncled. Spikelets small.

A. glabra, Stapf (Prain, Flor. Trop. Afr., IX, 172 = *Andropogon intermedius*, var. *punctatus*, Stapf in Dyer, Flor. Cap., VII, 345).

Hartebeestpoort Dam, Pretoria, *Pole Evans* 701; Mosdene, Naboomspruit, *Galpin* M. 437; Godwan River, *Pole Evans* 696; Rooikop, Bushveld, *Pole Evans* 263; Pienaars River, *Pole Evans* 166; Wonderfontein, Marico, *Burt-Davy* 7220; Bushveld, Pretoria, *Reck* in *Nat. Herb.* 99; Waterberg, *Burt-Davy* 2294; Shilovane, Zoutpansberg, *Junod* in *Nat. Herb.* 101.

Stapf describes the pedicelled spikelet of this species as being "not pitted," but in nearly all these specimens the pit on the lower glume of the pedicelled spikelet is distinct. *Burt-Davy* 7220 exhibits a panicle with all of the spikelets, except a few towards the top

of the inflorescence, unpitted; Reek's specimen from Pretoria has some of the pedicelled spikelets unpitted, while others have one or occasionally two pits. Galpin's specimen presents a very robust form with leaves hairy beneath and up to 15 mm. broad and panicle 17 cm. long.

A. insculpta, Stapf (in Prain, Flor. Trop. Afr., IX, 175=*Andropogon pertusus*, var. *capensis*, Stapf in Dyer, Flor. Cap., VII, 345).

Barberton, *Burt-Davy* 237; Onderstepoort, Pretoria, *Native Aaron* in *Nat. Herb.* 93; Sterkstroom, *Burt-Davy* 132; Waterval Boven, *Burt-Davy* 1446; Pyramid Estate, near Potgietersrust, *Galpin* 8880; Mosdene, Naboomspruit, *Galpin* M. 411; Rooikop, Bushveld, Pretoria, *Pole Evans* 515.

XIII. *DICHANTHIUM*, Willemet (134D).

Spikelets 2-nate, one sessile, the other pedicelled, similar in shape, different in sex, except the lowermost 1 or 2 pairs of each raceme which are (with occasional exceptions in *D. annulatum*) homogamous (♂ or neuter), in many-jointed shortly peduncled subdigitate, rarely subpanicled or racemously arranged, racemes; joints and pedicels filiform, solid, disarticulating subhorizontally, except the lowest barren pairs; fertile sessile and pedicelled spikelets deciduous, the former with the adjacent joint and pedicel. Florets 2 in the fertile sessile spikelets (lower reduced to an empty valve, upper ♀), 1 in the barren sessile and all the pedicelled spikelets, ♂ or neuter, or suppressed. Sessile spikelet dorsally compressed, awned (except the basal homogamous ones); callus small shortly bearded. Glumes equal, thinly chartaceous; lower usually very obtuse, 2-keeled, with narrow sharply inflexed margins; upper boat-shaped, 3-nerved, acutely keeled. Valve of lower floret hyaline, nerveless, of upper floret reduced to a hyaline upwards firmer linear stipe, passing into a slender awn (very rarely finely 2-toothed with the awn from the sinus in a doubtful or aberrant Indian species). Valvule 0 or minute. Lodicules 2, minute, glabrous. Stamens 3. Stigmas exerted laterally at or above the middle or near the tips. Grain oblong, obtuse, dorsally compressed; embryo rather more than half the length of the grain. Pedicelled spikelet awnless; valve, if present, hyaline, nerveless.

Perennial, very rarely annual, grasses with simple or branched usually many-noded culms, bearded or beardless at the nodes. Panicles usually subdigitate with a short or very short primary axis, rarely the latter elongated; racemes always shortly peduncled. Spikelets small, rarely the male somewhat larger.

D. annulatum, Stapf (Prain, Flor. Trop. Afr., IX, 178=*Andropogon annulatus* Forsk., Stapf in Dyer, Flor. Cap., VII, 350).

Mosdene, Naboomspruit, *Galpin* M. 411a.

D. pappilosum, Stapf (in Prain, Flor. Trop. Afr., IX, 179).

Near Selous River, Rustenburg, *Burt-Davy* 153; Meintjes Kop, Pretoria, *Burt-Davy* 3552; Komatipoort, Barberton, *Burt-Davy* 369; Skinners Court, Pretoria, *Native Aaron* in *Nat. Herb.* 102.

XIV. *SCHIZACHYRIUM*, Nees. (134E).

Spikelets 2-nate, of each pair differing in sex and mostly also more or less in shape and size, one sessile, the other pedicelled, on the articulate fragile rhachis of many-jointed solitary racemes terminating the culms and their branches, supported by spathes and frequently collected into a false panicle, the sessile spikelets falling with the contiguous joint, and the accompanying pedicelled spikelet; joints and pedicels thickened upwards, often rather stout, with a scarious cupuliform and more or less dentate terminal appendage. Florets 2; lower reduced to an empty valve, upper ♀ in the sessile, ♂, neuter or 0 in the pedicelled spikelets or both suppressed in these. Sessile spikelets dorsally compressed or sometimes in their lower half almost terete, awned; callus short, with a short beard at the very base. Glumes equal or subequal, lower chartaceous (often thinly) to subcoriaceous, more or less convex (to sub-semiterete) or flat on the back with, at least from

the middle upwards, sharply inflexed and mostly narrow margins, 2-keeled, the keels running out into teeth or mucros; upper thinner to membranous, narrowly boat-shaped to dorsally flattened, keeled (at least upwards), 1-3-nerved, the delicate margins ciliate. Valves ciliate, hyaline, of lower floret membranous downwards and often purplish 2-nerved, of upper usually 2-fid, sometimes very deeply, or 2-dentate, rarely entire, awned, awn from the sinus or continuing the entire valve. Valvule 0 or a microscopic hyaline scale. Lodicules 2, minute, glabrous. Stamens 3, rarely 2. Stigmas laterally exerted low down; styles terminal. Grain narrowly linear in outline or tapering upwards, subterete; embryo short. Pedicelled spikelet similar to the sessile, but usually relatively broader and flatter or more or less reduced and then sometimes quite small. Glumes more or less membranous, the lower aristulate or mucous. Valves (if present) hyaline, ciliate, mucous.

Annual or perennial grasses, rarely suffrutescent, never very tall. Culms slender. Leaf-blades folded in bud, usually narrow. False panicles varying from very loose and scanty to densely fasciated with the spathes mostly very narrow scarious, membranous or lower down herbaceous.

S. semiberbe, Nees. (ex Stapf in Prain, Flor. Trop. Afr., IX, 195 = *Andropogon hirtiflorus*, var. *semiberbis*, Stapf in Dyer, Flor. Cap., VII, 337).

Mosdene, Naboomspruit, *Galpin* M. 414; Henley-on-Klip, *Stent* in *Nat. Herb.* H. 21114; Pretoria, *Stent* in *Nat. Herb.* H. 110; Waterval Boven, *Burt-Davy* 1447; Crocodile River, *Burt-Davy* 210; Johannesburg, on hill-slopes, *Bryant* C 38; Springbok Flats, Waterberg, *Burt-Davy* 1121; Warmbaths, *Baylis* in *Nat. Herb.* H. 125.

"There is no doubt that this grass would be quite suitable for the manufacture of paper-pulp on a commercial scale."—*Imp. Inst. Rep.* 8/5/18.

XV. ANDROPOGON, Linn. (134).

Spikelets 2-nate, those of each pair differing in sex and mostly also more or less in shape and size, or those of the lowest pair of the lowest raceme homogamous (♂ or imperfect), one sessile, the other pedicelled on the articulate fragile rachis of many-jointed paired (very rarely solitary) or corymbose (digitate or subdigitate) racemes terminating the culms, and, if these be branched, also their branches, or at least, the upper; raceme-pairs or corymbs supported by a spathe or spatheole and frequently collected into a false panicle; the sessile spikelets falling with the contiguous joint and the accompanying pedicel; joints and pedicels filiform or thickened upwards (rarely stout in members of *Piestium*) and then the tips frequently more or less cupular or auricled. Florets 2; lower reduced to an empty valve, upper ♂ in the sessile spikelets of the heterogamous pairs, ♂, neuter or suppressed in those of the homogamous pairs and in the pedicelled spikelets. Sessile spikelets dorsally or laterally compressed, nearly always awned; callus short, mostly quite obtuse, shortly bearded. Glumes equal or subequal, subcoriaceous to membranous, the lower flat or concave or channelled on the back, with, at least from the middle upwards, sharply inflexed margins, 2-keeled, the upper more or less boat-shaped, keeled upwards 3-1-nerved, sometimes aristulate. Valves ciliate or ciliate, rarely glabrous, of lower floret hyaline, 2-nerved, of upper 2-fid or 2-dentate, hyaline or firmer and sometimes substipitiform below the insertion of the awn. Valvule a hyaline nerveless scale, or 0. Lodicules 2, minute, glabrous. Stamens 3. Stigmas laterally exerted; styles terminal. Grain narrowly lanceolate to oblong in outline, subterete to plano-convex; embryo about half the length of the grain. Pedicelled spikelets often very different from the sessile in shape and less so in size, always more or less compressed dorsally, never concave or channelled on the back, sometimes reduced and then often small or quite suppressed. Glumes herbaceous-chartaceous to membranous, the lower mucous or very rarely aristulate. Valves, if present, hyaline, ciliate, mucous.

Mostly perennial grasses of varying habit.

A. eucomis, Nees.

Malmanie Oog, Lichtenburg, *Burt-Davy* 80; Vereeniging, *Brandmuller* 44; Panplaats, Middelburg, *Burt-Davy* 13260; Skinners Court, Pretoria, *Burt-Davy* 1023.

A. appendiculatus, Nees.

Schweizer Reneke, *Burt-Davy* 1697; Experiment Farm, Ermelo, *Burt-Davy* 3914; Skinners Court, Pretoria, *Stent* in *Nat. Herb.* 148; Volksrust, Wakkersstroom, in *Nat. Herb.* 150; Henley-on-Klip, *Stent* in *Nat. Herb.* H. 21129; Heilbron, Vereeniging, *Brandmuller* 3; Tzaneen, Zoutpansberg, *Sampson* in *Nat. Herb.* 141; Beginsel, Standerton, *Burt-Davy* 926; Johannesburg, *Burt-Davy* 832.

"A useful hay-grass valued for feeding."—*J. Burt-Davy*. Strongly stoloniferous.

A. schirensis, Hochst., var. **augustifolia**, Stapf.

Henley-on-Klip, *Stent* in *Nat. Herb.* H. 21140; Aapies River, Pretoria, *H. Bolus* 10851; Downs, Zoutpansberg, *Junod* 4092; Billey's Vlei, Ermelo, *Burt-Davy* 9264; Middelburg, *Burt-Davy* 13295.

A. Schinzii, Hack.

Kosters River, Rustenburg, *Burt-Davy* 151; Pillansberg, Rustenburg, *Pole Evans* 633; Pyramid Estate, near Potgietersrust, *Galpin* 8885.

A. amplexans, Nees.

Henley-on-Klip, *Stent* in *Nat. Herb.* H. 21139; Vereeniging, *Brandmuller* 42; Groenkloof, Pretoria, *Phillips* H. 21684; open veld, Downs, Zoutpansberg, *Junod* 4096; Johannesburg, *Bryant* D. 8; Experiment Farm, Ermelo, *Burt-Davy* 7720; Uitgevalen, Heidelberg, *Burt-Davy* 13667; Potchefstroom, *Burt-Davy* 2700.

"Not liked by stock, grows in tufts on well-drained sandy soil devoid of humus."—*Brandmuller*.

A. filifolius, Steud.

Mariesstad, *Pott* 5196; Belfast, Middelburg, *Burt-Davy* 1336; near Bossis, Carolina, *Burt-Davy* 2959; Lake Chrissie, *Hamilton* in *Nat. Herb.* 89; Spionkop, Ermelo, *Burt-Davy* 9239.

A. huillensis, Rendl.

Panplaats, Pan Station, Middelburg, *Burt-Davy* 13264; Johannesburg, *Hutton* 254; Pyramid Estate, near Potgietersrust, *Galpin* 8884.

XVI. **CYMBOPOGON**, Spreng. (134f).

Spikelets 2-nate, those of each pair differing in sex and more or less in shape—except those of the lowest pair of the lower or of both racemes, which are homogamous (♂ or neuter)—one sessile, the other pedicelled on the articulate fragile rhachis of many-jointed paired racemes, terminating the culms and their branches; raceme-pairs supported by a spatheole, collected into often decompound or supra-decompound spatheate panicles; the fertile spikelets falling with the contiguous joint and the accompanying pedicel; joints and pedicels filiform or linear with frequently more or less cupular or auricled tips, those of the lowest pair (raceme-base) often conspicuously swollen, oblong or barrel-shaped, and hard. Florets 2; lower reduced to an empty valve, upper ♀ in the sessile spikelets of the heterogamous pairs, ♂, rarely neuter, in those of the homogamous pairs and in the pedicelled spikelets. Fertile spikelets dorsally, rarely laterally, compressed, awned (normally); callus very short, obtuse, shortly bearded. Glumes equal or subequal, more or less chartaceous, the lower almost flat or slightly depressed or narrowly grooved on the back with at least from the middle upwards sharply inflexed margins, 2-keeled, the upper more or less boat-shaped, keeled upwards, usually 1-nerved. Valves ciliate or ciliolate (sometimes obscurely), of the lower floret entire, hyaline, 2-nerved, of the upper 2-fid or 2-lobed,

hyaline, rarely firmer and almost stipe-like below the insertion of the awn; column of awn, if any, smooth. Valvule 0. Lodicules 2, minute, glabrous. Stamens 3. Stigmas laterally exerted; styles terminal. Grain oblong in outline, subterete to plano-convex in cross-section; embryo about half the length of the grain. Pedicelled spikelets usually slightly different in shape and size from the sessile, but never depressed or grooved on the back. Glumes muticous, the lower chartaceous to subchartaceous, the upper thinner. Of the valves, only that of the lower floret present hyaline, 2-nerved; upper floret usually represented by a naked ♂ flower, rarely suppressed.

Perennial, densely tufted and usually aromatic grasses, with often very coarse leaves, and frequently much compound and contracted spatheate panicles.

C. marginatus, Stapf. (in Prain, *Flor. Trop. Afr.*, IX, 280 = *Andropogon nardus*, var. *marginatus*, Stapf in Dyer, *Flor. Cap.*, VII, 351).

Groenkloof, Pretoria, *Phillips*; Beginsel, Standerton, *Burt-Davy* 1807; Houtbosch, Pietersburg District, *Bolus* 10932; Crocodile River, near Pretoria, *Burt-Davy* 9281; Wonderboom, near Pretoria, *Burt-Davy* 8912; Pilgrims Rest, Lydenburg, *Burt-Davy* 439.

C. validus, Stapf. (= *Andropogon nardus*, var. *validus*, Stapf in Dyer, *Flor. Cap.*, VII, 352). Hamanskraal, near Pretoria, *Burt-Davy* 1085.

One of the tambookie grasses.

C. plurinodes, Stapf. (= *Andropogon pluri nodis*, Stapf in Dyer, *Flor. Cap.*, VII, 353).

Ermelo, *Burt-Davy* 3897, 5462, 966; Henley-on-Klip, *Stent* in *Nat. Herb.* 21110; Koster River, Rustenburg, *Burt-Davy* 170, 137; Vierfontein, Schweizer Reneke, *Burt-Davy* 1631; Uitgevalen, Heidelberg, *Burt-Davy* 9173; near Smitskraal, Bloemhof, *Burt-Davy* 10099; Doornkloof, Irene, near Pretoria, *Pole Evans* 384.

C. excavatus, Stapf (in Prain, *Flor. Trop. Afr.*, IX, 285 = *Andropogon Schoenanthus*, var. *versicolor*, Hack, ex Stapf in Dyer, *Flor. Cap.*, VII, 354).

Henley-on-Klip, *Stent* in *Nat. Herb.* H. 21142; Mosdene, Naboomspruit, Waterberg, *Galpin* M. 417; Heilbron, Vereeniging, *Brandmuller* 27; Johannesburg, *Bryant* D. 25; Skinners Court, Pretoria, *Native Aaron* in *Nat. Herb.* H. 213; Downs, Zoutpansberg, *Junod* 4084; Welverdiend Station, Potchefstroom, *Burt-Davy* 14583; Sterk Hill, Lydenburg, *Burt-Davy* 470; Waterval Boven, *Burt-Davy* 1438; Crocodile River, Rustenburg, *Burt-Davy* 9288; Irene, near Pretoria, *Pole Evans* in *Nat. Herb.* 216, 353, 204.

One of the turpentine grasses containing an essential oil that gives the grass a hot, bitter taste. It is seldom eaten by stock.

XVII. HYPARRHENIA, Anderss. (1346).

Spikelets 2-nate, those of each pair differing in sex and more or less in shape, or those of the lowest pair or pairs homogamous (♂ or neuter), one sessile, the other pedicelled, on the articulate fragile rhachis of few- to many-jointed paired racemes, terminating the culms and their branches; raceme-pairs supported by a spatheole, collected into scanty or compound to decompound spatheate panicles; the fertile spikelets falling with the contiguous joint and the accompanying pedicel; joints and pedicel finely filiform with more or less obliquely truncate sometimes obscurely auricled tips, in racemes with homogamous spikelets, the joint or joints below the lowest fertile spikelet entering into the formation of the raceme-base, shorter to very short, eciliate and tardily disarticulating. Florets 2; lower reduced to an empty valve, upper ♀ in the sessile spikelets of the heterogamous pairs, ♂ or neuter (rarely quite suppressed) in those of the homogamous pairs and in the pedicelled spikelets. Fertile spikelets more or less flattened dorsally, but with rounded sides, awned, very rarely awnless; callus short and obtuse or more often acute to pungent, shortly bearded. Glumes equal, more or less chartaceous, mostly thin, the lower narrowly truncate or 2-dentate, sometimes with a very shallow

longitudinal depression, with very narrow involute margins up to two-thirds or more, then equally narrowly inflexed from the very fine short or obscure keels, the upper narrowly and shallowly boat-shaped, rounded on the back below, finely keeled towards the tips only, 3-nerved. Valves ciliate or ciliolate or that of the upper floret glabrous, of lower floret hyaline, 2-nerved (often very faintly), rarely quite nerveless, of upper stipitiform with a very fine delicate base, above it gradually hardened with narrow hyaline margins, which usually run out into minute teeth, passing between the teeth into the mostly distinctly kneed more or less hirtellous or subplumose awn. Valvule 0, rarely a small hyaline scale. Lodicules 2, minute, glabrous. Stamens 3. Stigmas laterally exerted; styles terminal. Grain oblong in outline, subterete to plano-convex in cross-section; embryo about half the length of the grain. Pedicelled spikelets acute, often mucronate or aristulate from the lower glume, usually somewhat longer than the fertile and more distinctly 2-keeled (often from below the middle). Valves of both florets developed, even in neuter spikelets, rarely the upper or both suppressed.

Perennial or annual, mostly coarse, grasses, with often large loose, rarely much contracted, panicles, never aromatic.

H. hirta, Stapf (in Prain, Flor. Trop. Afr., IX, 315 = *Andropogon hirtus*, Linn.; Stapf in Dyer, Flor. Cap., VII, 355).

Henley-on-Klip, *Stent* in *Nat. Herb. H.* 21127; Pretoria, *Stent* in *Nat. Herb. H.* 5161; *Burt-Davy* 3395, 3802; Heilbron, *Brandmuller* 26; near Wolhuters, Sterkstroom, *Burt-Davy* 133; Malmanie Oog, *Burt-Davy* 77, 70; Uitgevalen, Heidelberg District, *Burt-Davy* 12668; Tzaneen, Zoutpansberg, *Sampson* in *Nat. Herb. H.* 4383; Henley-on-Klip, *Stent* in *Nat. Herb. H.* 21127; Kaalfontein, near Pretoria, *Pole Evans* in *Nat. Herb. H.* 17561; Irene, near Pretoria, *Burt-Davy* 33 *Pole Evans* 226, 354, 403.

“Useful as a thatch grass when no better grass is at hand.”—*Brandmuller*.

H. auctus, Stapf (= *Andropogon auctus*, Stapf, in Dyer, Flor. Cap., VII, 357).

The Willows, Pretoria, *Burt-Davy* 1694; Johannesburg, *Bryant* C. 40; Vlakfontein, near Onderstepoort, Pretoria, *Burt-Davy* 4029; Sterkstroom, Rustenburg, *Burt-Davy* 138.

H. rufa, Stapf (in Prain, Flor. Trop. Afr., IX, 304 = *Andropogon rufus*, Kunth., ex Stapf in Dyer, Flor. Cap., VII, 358).

Tzaneen, Zoutpansberg, *Rogers* 12510; Barberton, *Burt-Davy* 278, 246; Zoutpansberg, *Wordsdeel* in *Nat. Herb. H.* 5918; Sterk Hill, Lydenburg, *Burt-Davy* 469.

H. dregeana, Stapf (= *Andropogon dregeanus*, Nees, ex Stapf in Dyer, Flor. Cap., VII, 359).

Stream at Houtenbek, near Lydenburg, *Burt-Davy* 517; Sterk Hill, Lydenburg, *Burt-Davy* 469.

“This grass yielded pulp of good quality; an excellent brown paper could be made from it by treatment with small amounts of caustic soda, while the pulp obtained with larger proportions of caustic soda could be readily bleached and used for the manufacture of white paper of good quality.”—*Imp. Inst. Rep.*, 8/5/18.

H. dichroa, Stapf (in Prain, Flor. Trop. Afr., IX, 302 = *Andropogon dichroa*, Steud., ex Stapf in Dyer, Flor. Cap., VII, 360).

Tzaneen, Zoutpansberg, *Burt-Davy* 2631.

“Used as a thatching grass in the Orange Free State.”—*Hilder*.

H. buechanani, Stapf (= *Andropogon buechanani*, Stapf in Dyer, Flor. Cap., VII, 362).

Premier Mine, Pretoria, *Menzies* 8; Skinners Court, Pretoria, *Native Aaron* in *Nat. Herb. H.* 7906; Sterk Hill, Lydenburg, *Burt-Davy* 469; Irene, near Pretoria, *Burt-Davy* 36.

“Its stems are slender, 4–5½ ft. long with pith in the internodes and somewhat refractory nodes 10–15 in. apart; the ultimate fibres are mostly 1.5–2.5 mm. in length,



Plate III.

Hyparrhenia glauca, Stent.

A, Lower glume of pedicelled spikelet ; B, Upper glume of pedicelled spikelet ; C, Sessile spikelet (showing lower glume) ; D, Upper glume of sessile spikelet ; E, Lower valve of sessile spikelet ; F, Upper valve of sessile spikelet ; G, Pistil and stamens of sessile spikelet ; H, Ligule.

and somewhat drastic treatment is required to bleach the pulp to a pale cream colour. but the paper produced is opaque, of good strength and quality, and does not shrink appreciably in the drying. It gives a good, long fibre pulp suitable for strong brown paper, or, after bleaching, for fairly good cream-coloured or white paper, and is regarded as of about the same value as Algerian esparte."—*Imp. Inst. Bull.* XIX, 2, 1921.

H. cymbaria, Stapf (Prain, Flor. Trop. Afr., IX, 332 = *Andropogon cymbarius*, Linn., ex Stapf, Flor. Cap., VII, 360).

New Agatha, Zoutpansberg, *McCallum* in *Nat. Herb.* 189; Irene, near Pretoria, *Hutchins* in *Nat. Herb.* H. 193; Malta, Zoutpansberg, *Junod* 4431; Zeerust, *Burt-Davy* 119; White Umbelusi, *Burt-Davy* 10609; Magoobaskloof, Houtbosch-berg, *Burt-Davy* 2604; Pyramid Estate, near Potgietersrust, *Galpin* 8887.

H. tamba, Anderss. (Stapf in Prain, Flor. Trop. Afr., IX, 336).

Waterval Onder, Carolina, *Burt-Davy* 393; Waterval Boven, Carolina, *Burt-Davy* 1419, 392.

H. variabilis, Stapf (Prain, Flor. Trop. Afr., IX, 334).

Godwan River, Carolina, *Pole Evans* 692.

H. filipendula, Stapf (in Prain, Flor. Trop. Afr., IX, 322 = *Andropogon filipendulus*, Hochst., ex Stapf in Dyer, Flor. Cap., VII, 362).

Mosdene, Naboomspruit, Waterberg, *Galpin* M. 415; Wolverkraal, Kameel River, *Pole Evans* 610; Godwan River, *Pole Evans* 693; Shilovane, Zoutpansberg, *Junod* 2213, 96.

H. Ruprechtii, Fourn. (Stapf in Prain, Flor. Trop. Afr., IX, 326 = *Andropogon Ruprechtii*, Hack., ex Stapf in Dyer, Flor. Cap., VII, 365).

Warmbaths, *Burt-Davy* 1153; Mosdene, Naboomspruit, Waterberg, *Galpin* M. 418; between Nelspruit and White River, Barberton, *Burt-Davy* 1513; Komatipoort, Barberton, *Burt-Davy* 382; Barberton, *Burt-Davy* 288; Springbok Flats, Waterberg, *Burt-Davy* 1120.

"Zulu name 'unTshaba. It forms dense clumps reaching 10 ft. in height with hard nodes 11–14 in. apart. It gives a good yield of pulp, but the ultimate fibres are somewhat short, mostly ranging from .8 to 2 mm. in length. There is a considerable native demand for most of these tambookie grasses for thatch."—*Imp. Inst. Bull.*, Vol. XIX, 2, 1921.

H. glauca, Stent, n. sp.

Gramen perenne, ad 240 cm. altum, innovationibus intravaginalibus; culmi valde-dissimi, erecti, 4–8 mm. diam. tereti, glabri, saepe rubescentes, plus minus pruinosi, 7–9 nodis, supra nodis tumidi, simplices vel ramosi.

Vaginae foliorum firmæ, teretes vel apicem versus tenuiter, carinatae, glabrae. *Ligulae* scariosae, rotundatae, ad 4 mm. longae, flavae vel rufae, glabrae. *Laminae* lineares, apicem setiformam paullatim, attenuatae, ad 80 cm. longae, 12 mm. latae, glabrae, glaucae, subtus laevae, supra marginibusque scabrae; costa parvis valida, ad basim 2–4 mm. lata, supra albida, subtus prominente, nervis utrinque lateralibus 4–5. *Panicula* longa, laxa, gracilis, 5–8 nodis; internodiis infimis ad 29 cm. longis, sequentibus brevioribus, folia subtendentia perfecta, sed apicem versus minora. *Rami* primarii fasciculati, plerumque 3–4 nati, inferiores 30–60 cm. longi ab basim 10–30 cm. indivisi, plerumque 3–4-nodi; ramuli filiformi, 1–4 pedunculis spatheatis simplices ferenti. *Spatheolae* angustae, 4–6 cm. longae, setaceo-acuminatae, apicem versus rubescentes, cetera glauco-virides, deinde omnino rubescentes, glabrae, vel pilis longis dispersis, minute scaberulae. *Pedunculi* communes filiformes, ad 45 mm. plerumque circa 15 mm. longi, in spatheolis inclusi, apicem versus longe albidio-hirsutae. *Racemorum basi* breviores, dense pubescentes, et pilis albidis longis et tuberculis ortis barbata, spicula infimae basi in appendice scarioso denticulato 1 mm. longo producti. *Racemi* spatheola a latere exserti, plus-minus (aliquando late) divaricati, tandem reflecti et plus minus contigui, circa 15 mm. longi, aristis 8 quoque racemorum pare; articuli pedicellique gracilis, ciliati, spiculae duae racemis infimis basi mucronatae, 12 mm. longae. Spicula pedicellata ♂ 12 mm. longa; *gluma inferior* angusta,

virida, carinis scabridis, minute bidentata, mucrona ad 2 mm. longa, 11–13 nervis, prominentibus sparse appressequae pilis longis hirsuta; *gluma superior* gracile membranacea, 3–5 nerva, lineare lanceolata, acute acuminata, pilis longis appressis; *valva* hyalina, glumis paulo brevior, ciliata 1–nerva; *lodiculæ* carnosae, cuneatae; 5 mm. longae; *antherae* ad 4 mm. longae. *Spicula sessila* ♀, pallido-virida, 5 mm. longa, callum brevior obtusum sparse barbatum annuerans; *gluma inferior* minute truncata, hirsuta, dorso plano, in parte superior carinis duobus, 7-nervis; *gluma superior* tenuiter chartacea, marginibus hyalinis 3-nervis, carina lata rotundata; *valva inferior* paulo glumis brevior, angusta, hyalina, enerva, apice obtuse; *valva superior* glumis multa brevior, hyalina, biloba, lobis angustis, obtusis; *arista* gracila, circa 10 mm. longa; *caryopsis* oblonga; *styli* distincti.

Groenkloof Valley, Pretoria, *Stent* in *Nat. Herb.* H. 21425.

The upper valve of the hermaphrodite floret often appears to be stipitiform, the delicate hyaline margins and lobes being closely rolled round the base of the awn.

A remarkably glaucous species; the light blueish-grey colour of the foliage renders it most conspicuous from a distance.

XVIII. MONOCYMBIUM, Stapf (134H).

Spikelets 2-nate, those of each pair differing in sex and structure otherwise alike in shape, one sessile, the other pedicelled on the articulate fragile rachis of many-jointed solitary racemes, terminating the culms and their branches; each raceme supported by a spatheole and forming with it a monostachyum; monostachya collected into loose spatheate panicles; the fertile spikelets falling with the adjacent joint and the accompanying pedicel; joints and pedicels finely filiform with truncate tips. Florets 2; lower reduced to an empty valve, upper ♀ in the sessile spikelets, ♂ in the pedicelled. Sessile spikelets dorsally flattened with rounded sides, awned; callus short and obtuse, indistinctly marked off from the lower glume, obscurely bearded. Glumes sub-equal, thinly cartilaginous, the lower obtuse, with narrow involute margins, not or very obscurely keeled near the tips, the upper boat-shaped, rounded on the back, laterally compressed and keeled in the upper third, usually aristulate, 3-nerved. Valve of the lower floret hyaline, ciliate, of the upper eciliate, deeply 2-fid, with a hyaline base, margins and lobes, otherwise cartilaginous, eciliate, delicately awned from between the lobes. Valvule 0. Lodicles 2, minute, cuneiform, glabrous. Stamens 3. Stigmas laterally exserted; styles terminal. Grain oblong, dorsally slightly compressed; embryo about half the length of the grain. Pedicelled spikelets in outline and size, very similar to the sessile, but muticous. Valves of both florets developed, hyaline, or the upper more frequently suppressed.

A perennial grass, with the coloured cymbiform spatheoles of a *Hyparrhenia* of the *Cymbaria* group, but easily recognized by its solitary racemes.

M. cerisiiforme, Stapf (in Prain, *Flor. Trop. Afr.*, IX, 386 = *Andropogon cerisiiformis*, Nees., in Dyer, *Flor. Cap.*, VII, 337).

Groenkloof, Pretoria, *Phillips* H. 21685; Mosdene, Naboomspruit, Waterberg, *Galpin* M. 416; Johannesburg, *Bryant* D. 6; Sterk Hill, Lydenburg, *Burt-Davy* 457; Ermelo, *Burt-Davy* 5501; Tzaneen, Zoutpansberg, *Sampson* in *Nat. Herb.* 131; Heidelberg, *Burt-Davy* 7769; Panplaats, Pan Station, Middelburg, *Burt-Davy* 13263; Cypress Point, Zoutpansberg, *Junod* 4085; Naboomfontein, *Schlechter* 4300; Belfast, Middelburg, *Burt-Davy* 1335; Henley-on-Klip, *Stent* in *Nat. Herb.* H. 21113; Pyramid Estate, near Potgietersrust, *Galpin* 8888.

XIX. HETEROPOGON, Pers. (124t).

Spikelets 2-nate, those of the lower (1 to many) pairs alike in sex and shape, ♂ or neuter, of the upper pairs differing in sex and strikingly so in shape, one of each pair sessile, the other pedicelled on the many-jointed rachis of solitary racemes, terminating the culms and their upper branches; rachis tough or upwards tardily disarticulating and glabrous between the homogamous pairs, readily disarticulating above them; homogamous pairs

ong-persistent, the spikelets of the heterogamous pairs falling separately, the pedicelled with the pedicel, the sessile with the adjacent joint and the adjacent pedicel or its base. Florets 2; lower reduced to an empty valve, upper ♀ or ♂ in the sessile spikelets of the heterogamous pairs, ♂ or neuter in all the other spikelets. Fertile spikelet terete or subterete, awned; callus long, pungent, densely bearded upwards. Glumes equal; the lower coriaceous, rarely chartaceous, more or less tightly involute, quite keelless, nerves obscure, often connected by a few transverse nerves in the upper part; the upper with a deep longitudinal groove on each side, coriaceous, rarely chartaceous, between them, thinner towards the margins, membranous at the tips, 3-nerved. Valve of lower floret hyaline, nerveless, of upper floret stipitiform from a hyaline very slender base, cartilaginous upwards and passing into a usually stout geniculate awn. Valvule small or 0. Lodicles large or more or less reduced, to very minute. Stamens 3, often rudimentary, or 0. Stigmas exerted terminally or laterally. Grain more or less linear in outline, subterete, slightly dorsally compressed; embryo somewhat exceeding the middle of the grain. Male (or neuter) spikelets dorsally flattened, usually slightly asymmetric, and often somewhat twisted, muticous, imbricate. Lower glume herbaceous, many-nerved, winged upwards from one or both keels; upper membranous, lanceolate-oblong, acute, 3-nerved. Valves hyaline, 1-nerved, well developed or more or less reduced. Stamens 3 or 0.

Perennial or annual grasses, with simple or more often upwards branched culms; branches few to many, mostly flowering and gathered into a spatheate panicle; racemes conspicuously dorsiventral, the bases of the ♂ (or neuter) spikelets subimbricate on the back of the raceme, their upper parts bending forward around the sides, forming a hollow in which the fertile spikelets are enclosed, with their awns exerted anticously and often intertwined.

H. contortus, Roem. & Schult. (Stapf in Prain, Flor. Trop. Afr., IX, 410 = *Andropogon contortus*, L. in Flor. Cap., VII, 350).

Kimberley, *Wilman*; Mosdene, Naboomspruit, Waterberg, in loam formation, *Galpin* M. 412; Koster River, Rustenburg, *Burt-Davy* 151; Leeuwpoort No. 195, Carolina, *Burt-Davy* 7332; Spitzkop, Ermelo, *Pott* 5210; Warmbaths, Waterberg, *Burt-Davy* 2225; near Nylstroom, Waterberg, *Burt-Davy* 2104; Schweizer Reneke, *Burt-Davy* 1665; Welverdiend Station, Potchefstroom, *Burt-Davy* 14578; Uitgevallen, Heidelberg, *Burt-Davy* 9183; Experiment Farm, Ermelo, *Burt-Davy* 915.

"Spear grass"—"Steek gras." A useful fodder grass when young, but the sharp-bearded calli of the mature spikelet render the grass, when in seed, very troublesome and often dangerous to stock, the "seeds" often pierce right into the flesh of small stock, causing great irritation and even in some cases death; in cattle, these "seeds" have been known not only to injure the beasts, but to materially damage the hide for commercial purposes.

XX. CLEISTACHNE, Benth. (134).

Spikelets solitary, all alike, ♀, pedicelled on the tough rhachis of racemously arranged or paniced racemes, falling entire from the thickened tips of the pedicels. Florets 2; lower reduced to an empty valve, upper ♀. Glumes equal, very similar, with involute margins, more or less coriaceous, delicately 7-9-nerved, muticous. Valves hyaline, lower 2-nerved, upper 2-dentate or subentire, 3-nerved, with a twisted flexuous awn from the sinus or tip. Valvule very minute, ciliate. Lodicles 2, broad-cuneate, sparingly ciliate. Stamens 3. Stigmas laterally exerted, plumose. Grain oblong to obovoid-oblong, very obtuse to truncate; embryo half the length of the grain.

Annual, rather coarse grasses. Leaf-blades long, flat, with stout midribs. Panicles narrow, more or less contracted, greyish or fulvously hairy.

C. sorghoides, Benth. (Stapf in Flor. Trop. Afr., IX, 154).

Godwan River, Carolina, *Pole Evans* 694.

A tropical grass and a new record for the Transvaal.

XXI. **THEMEDA**, Forsk. (136).

Spikelets 2-nate (the terminal 3-nate), those of the lower two pairs alike in shape and sex, ♂ or neuter, sessile to subsessile and closely approximate so as to form an involucre, of the following pair or pairs differing in sex and conspicuously so in shape, one of each pair sessile, the other pedicelled, on the rhachis of solitary racemes, terminating the culms and their upper branches; rhachis terete, tough or tardily disarticulating and glabrous between the homogamous pairs, readily disarticulating below the fertile spikelets; homogamous pairs or at least their sessile members persistent, the spikelets of the heterogamous pairs falling separately, the pedicelled with the pedicel, the sessile with the adjacent joint (if more than 1) and the base or bases of the adjacent pedicels. Florets 2; lower reduced to an empty valve, upper ♂ or neuter in the homogamous spikelets and the pedicelled members of the heterogamous pairs, ♀ in the sessile members of the latter. Fertile spikelets terete, awned or awnless; callus usually acute to pungent, densely bearded, beard more or less concealing the adjacent joint or pedicel-bases. Glumes equal, coriaceous, except at the submembranous tips; lower tightly involute, quite keelless, nerves very fine, obscure except in transmitted light, the upper with a deep longitudinal groove on each side, very firm between them, thin long, the margins 3-nerved. Valve of lower floret hyaline, nerveless, of upper floret stipitiform from a hyaline 1-nerved base, cartilaginous upwards and passing into a stout geniculate awn or hyaline and 1-nerved throughout, with the nerve becoming stouter upwards and passing into a more or less reduced awn or quite awnless. Valvule hyaline, nerveless, small or 0. Lodicules 2, somewhat large, glabrous. Stamens 3. Stigmas exerted subterminally or from near the middle of the floret. Grain linear-obovate, subterete, grooved on the face; embryo about half as long as the grain. Involucral spikelets dorsally much compressed, awnless. Lower glume more or less herbaceous, 2-keeled; upper membranous, very rarely suppressed. Both florets present or one or both suppressed, their valves hyaline, the upper with or without a valvule. Pedicelled spikelets of the heterogamous pairs similar to those of the homogamous pairs, but narrower.

Annual or perennial; usually coarse grasses, with scanty or compound to decompound spatheate panicles, and scattered or more or less crowded and often glomerate short 1- or 2- (very rarely 3-) awned or awnless monostachya.

T. triandra, Forsk. (Stapf in Flor. Trop. Afr., IX, 3, 416 = *Anthistiria imberbis*, Retz., ex Stapf in Dyer, Flor. Cap., VII, 366).

Var. **Burchelli**, Stapf.

Schweizer Reneke, Bloemhof, *Burt-Davy* 1642.

Var. **hispidula**, Stapf.

Near Nylstroom, Waterberg, *Burt-Davy* 2025A; Arcadia, Pretoria, *Burt-Davy* 12324; Ermelo, *Miss Tennant* in *Nat. Herb.* 259; Carolina, *Burt-Davy* 7425; Crocodile River, Rustenburg, *Burt-Davy* 224; Uitgevalen, Heidelberg, *Burt-Davy* 9174; Komatipoort, Barberton, *Burt-Davy* 362; Potchefstroom Farm, *Burt-Davy* 1052; Skinners Court, Pretoria, *Burt-Davy* 3809; Springbok Flats, Waterberg, *Burt-Davy* 1119.

Var. **glauca**, Stapf.

Meintjes Kop, Pretoria, *Miss Landsdell* in *Nat. Herb.* 253; Mosdene, Naboomspruit, Waterberg, *Galpin* M. 420.

Var. **punctata**, Stapf.

Near Nylstroom, Waterberg, *Burt-Davy* 2012; Mariestad, *Pott* 5212; Belfast, Lydenburg, *Burt-Davy* 1333; Sterk Hill, Lydenburg, *Burt-Davy* 455.

This is the well-known rooi gras—an excellent pasture and hay grass if cut before it gets too ripe. It is one of the grasses examined at the Imperial Institute for paper-making and was found to yield about the same quality and quantity of pulp as the tambookie and dek grasses previously reported on, except that the nodes being harder would require more boiling to render them soft enough for the purpose.

XXII. **ANTHEPHORA**, Schreb. (140).

Spikelets lanceolate to ovate-oblong, sub-sessile in deciduous squarrose clusters 4-6, on the very short branches of a cylindric apparently simple spike; lower floret reduced to an empty valve, upper ♀ or ♂, with or without the rudiments of an ovary. Glumes very dissimilar, lower always turned away from the centre of the cluster, coriaceous, oblong to lanceolate, distinctly nerved on the inner side, upper hyaline, setaceous subulate from a small ovate base. Valves more or less equal, usually shorter than the lower glume; lower oblong, hyaline, 5-7-nerved; upper similar, but firmer and 3-nerved. Pale equalling the valve and of similar substance, 2-nerved. Lodicules 0. Stamens 3; filaments fleshy at the base when young. Ovary lanceolate-oblong. Styles free or nearly so, very slender. Stigmas plumose, slender, exserted from or near the apex. Grain oblong-ellipsoid, enclosed in the spikelet; hilum punctiform; embryo large, equalling about half the length of the grain.

Perennial or annual; culms tufted and erect, or ascending from a prostrate base; ligules large scarious; spikelets in subspicate clusters with the irrespective lower glumes turned outwards so as to form a false involucre, usually with gaps between their bases.

A. pubescens, Nees.

Hamanskraal, Pretoria District, *Pole Evans* 392; Doornkloof, Irene, near Pretoria, *Pole Evans* 222.

Also known to occur plentifully near Naboomspruit in the Waterberg District and at Potchefstroom. A tufted grass with very glaucous leaves, useful pasture for stock, one of the earliest grasses in Bechuanaland.

XXIII. **TRAGUS**, Haller (143).

Spikelets sessile, in deciduous clusters of 2-4 on the filiform continuous axis of a cylindric spike-like panicle; rhachilla tough, not continued beyond the floret. Floret 1, ♀, somewhat shorter than the upper glume. Glumes very dissimilar, lower facing the rhachis, minute, hyaline, or suppressed, upper 5-ribbed or 5-nerved, membranous between the hispid or spinehooked ribs or nerves, exceeding the valve. Valve lanceolate or lanceolate-oblong, membranous, 3-nerved. Pale as long as the valve, 2-nerved. Lodicules 2, broad, cuneate, fleshy. Stamens 3. Styles distinct, very slender. Stigmas narrow, plumose, terminally exserted. Grain enclosed by the valve and pale, oblong to ellipsoid, slightly compressed from the back; embryo about one-third the length of the grain; hilum punctiform, basal.

Annual or perennial; culms erect, ascending or decumbent; blades linear, rather rigid with cartilaginous spinulously ciliate margins; ligules reduced to a delicate ciliate rim; panicles cylindric, slender; all the spikelets of a cluster, fertile, or often one more or less reduced.

T. racemosus, All.

Kafraria, Christiana, Bloemhof, *Burt-Davy* 14109; near Bloemhof, *Burt-Davy* 1504; Warmbaths, Waterberg, *Burt-Davy* 863; near Nylstroom, Waterberg, *Burt-Davy* 2084; Potgietersrust, Waterberg, *Burt-Davy* 2244; Mosdene, Naboomspruit, Waterberg, *Galpin* M. 409; Barberton, *Burt-Davy* 241; Pretoria, *Miss Tennant* in *Nat. Herb.* H. 6313; Vereeniging, *Brandmuller* 30; Zeerust, Marico District, *Burt-Davy* 115.

"Carrot seed grass"—a common weed of most warm countries.

T. Koelerioides, Aschers.

Vierfontein, Schweizer Reneke, *Burt-Davy* 1630; near Bamboespruit, Bloemhof, *Burt-Davy* 1521.

Creeping carrot seed grass—a short creeping grass, useful only as a crop for sheep.

XXIV. **MOSDENIA**, Stent (143A).

Spikelets sessile, solitary on the notches of a ribbed and scabrid common axis disarticulating from below the glumes and falling entire. Floret 1. Glumes subequal to equal, 3-4 mm. long, lower rather longer and broader than the upper, cymbiform, falcate rigidly membranous with a prominent scabrid keel; upper like the lower, but narrower and straighter. Valve about 3 mm. long, delicately hyaline, 1-nerved or sub 3-nerved. Pale nearly equalling the valve. Stamens 3. Ovary ovate. Styles short, distinct. Lodicules truncate, about as large as the ovary.

A prostrate ascending stoloniferous perennial, the stolons being covered with short, dry, densely imbricating scales. Leaf-sheaths tight, terete, the lower short. Ligule short, membranous. Inflorescence of solitary spikes terminating the culms.

M. Waterbergensis, Stent (*Bothalia* I, 3, 170).

Mosdene, Naboomspruit, Waterberg, *Galpin* M. 447.

A monotypic genus.

XXV. **PEROTIS**, Ait. (148).

Spikelets very small, narrow, sessile or sub-sessile on the continuous axis of a spike or a lax spike-like raceme, jointed on and falling entire from the axis or the rudimentary pedicels; rhachilla not continued beyond the floret. Floret 1, ♂, much shorter than the glumes. Glumes equal, linear or linear-lanceolate, rigidly membranous, 1-nerved, passing into capillary awns. Valve lanceolate, acute, delicately hyaline, 1-nerved. Pale very minute, hyaline nerveless. Lodicules 2, broad, cuneate. Stamens 3. Styles distinct, short. Stigmas plumose, laterally exserted. Grain cylindric, slender, exserted from the unchanged floret and enclosed with it in the glumes; embryo about one-third the length of the grain; hilum punctiform, basal.

Annual or subperennial; culms leafy; blades usually broad, rigid, and ciliate; ligules hyaline; spikes or pseudo-spikes slender, crinite from the long capillary awns.

P. latifolia, Ait.

Mosdene, Naboomspruit, Waterberg, *Galpin* M. 441; Warmbaths, Waterberg, *Burt-Davy* 861; Barberton, *Burt-Davy* 8014; Tzaneen, Zoutpansberg, *Sampson* in *Nat. Herb.* H. 4436; Riviera, Pretoria, *Mogg* in *Nat. Herb.* 10085; Waterval Boven, *Burt-Davy* 1410; Koster River, Pietersburg, *Burt-Davy* 157; Pyramid Estate, near Potgietersrust, *Galpin* 8883.

XXVI. **ARUNDINELLA**, Raddi. (153).

Spikelets small, $2\frac{1}{2}$ lin. to less than 1 lin. long, acute or acuminate, paniced, continuous with or imperfectly jointed on the pedicels; rhachilla disarticulating between the valves, glabrous, not produced beyond the upper floret. Florets 2, heteromorphous; lower ♂, rarely barren or ♀, upper ♀. Glumes persistent, acuminate, membranous, strongly 3-5-nerved, upper usually longer. Lower valve thin, equalling the lower glume or slightly longer, subacute or minutely truncate, 3-7-nerved; upper valve terete, rarely dorsally subcompressed, finally cartilaginous, entire or minutely 2-fid, 3-7-nerved, minutely scaberulous, lobes sometimes produced into fine bristles; awn terminal or from between the lobes, short, kneed or straight, or 0; callus very short, obtuse. Pales linear, 2-keeled; flaps more or less auricled. Lodicules 2, cuneate, rather fleshy or 0 in the lower floret. Stamens 3 or 0 in the lower floret. Ovary glabrous, oblong or more or less arrested, or 0 in the lower floret. Styles distinct. Stigmas plumose, laterally exserted. Grain oblong to ellipsoid, terete or dorsally subcompressed, tightly embraced by the valve and pale, free; hilum punctiform; embryo large; albumen hard.

Perennial, rarely annual; leaves various; panicles usually rather stiff; branches stiff, divided from the base.

A. Ecklonii, Nees.

Vlakfontein, near Amersfort, Wakkerstroom, *Burt-Davy* 4055; Skinners Court, Pretoria, *Stent* in *Nat. Herb.* H. 5076; Ermelo, *Burt-Davy* 5407; White Umbelusi, Zoutpansberg, *Burt-Davy* 10607; Waterval Boven, Lydenburg, *Burt-Davy* 1400; Vereeniging, *Brandmuller* 2.

"A coarse, hard grass of vleis and swamps; of apparently little feeding value"—*Burt-Davy*.

XXVII. MELINIS, Beauv. (154).

Spikelets linear-oblong, small, laterally compressed, panicle, deciduous from the capillary pedicels; lower floret reduced to an empty valve; upper ♂. Glumes very dissimilar, lower reduced to a minute scale, upper membranous, shortly 2-lobed, mucronulate from the sinus, prominently 7-nerved, glabrous, rarely hairy. Valves very dissimilar; lower rather like the upper glume, but more deeply lobed and usually with a fine awn from the sinus, 5-nerved; upper smaller, very thin and rigidly membranous, minutely 2-lobed, shining, obscurely 3-1-nerved with an equal, obscurely 2-nerved pale of similar substance. Lodicules 2, very delicate. Stamens 3. Styles free, slender. Stigmas plumose, laterally exerted. Grain unknown.

Perennial or annual (?); culms ascending from a prostrate, very slender, many-noded, branched base; ligules reduced to a fringe of short hairs; panicle contracted narrow, much divided, with capillary branchlets and pedicels; spikelets usually purple, at least, at the tip.

M. tenuinervis, Stapf (= *M. minutiflora*, var. *pilosa*, Stapf in Dyer, *Flor. Cap.*, VII, 447).

Barberton, *Burt-Davy* 270; Tzaneen, *Mogg* in *Nat. Herb.* H. 10454.

Nearly related to the molasses grass of tropical Africa—*Melinis minutiflora*.

XXVIII. ALLOTEROPSIS, Presl. (161A).

Spikelets ovate or elliptic to lanceolate-oblong, acute or acuminate, mostly awned, slightly or conspicuously compressed from the back, falling entire from the pedicels, 2-nate or fascicled, subsecund and abaxial on the triquetrous rhachis of more or less spiciform digitate or subdigitate racemes; lower floret usually ♂, upper floret ♀. Glumes unequal, lower smaller, membranous to hyaline, 3-1-nerved, very acute, often mucronulate, upper equal or subequal to the spikelet, membranous to chartaceous, 5-nerved with the outer nerves submarginal, densely ciliate along them. Lower floret: valve resembling the upper glume, but eciliate, the tip minutely truncate and the lateral nerves approximate to each other and in or near the marginal flexure; valvule short, deeply 2-fid, with conspicuously auricled flaps. Upper floret: valve chartaceous, glabrous, delicately ciliate upwards, 5-nerved, produced into a straight awn or mucronate; valvule equal to the valve, 2-keeled, with broadly auricled flaps. Lodicules 2, broadly cuneate. Stamens 3. Styles distinct. Stigmas laterally exerted. Grain enclosed by the valve and valvule, elliptic-oblong much compressed; scutellum about half the length of the grain; hilum basal, punctiform.

Perennial or annual; leaf-blades flat or more or less convolute; ligules membranous, ciliate or ciliate, short or reduced to a mere rim; racemes sessile or peduncled, often more or less compound towards the base, digitate or subdigitate on a more or less elongated common axis.

A. semialata, Hitch, var. **Ecklonii**, Stapf (*Flor. Trop. Afr.* IX, 3, 483 = *Axonopus semialatus*, Hook, var. *Ecklonii*, Stapf in Dyer, *Flor. Cap.*, VII, 418).

Vereeniging, *Brandmuller* 47; Ermelo, *Tennant* in *Nat. Herb.* 289; Ermelo, north of Blesbokspruit, *Burt-Davy* 946; Carolina, *Burt-Davy* 7367, 7446; Belfast, *Burt-Davy* 1323; Johannesburg, *Bryant* D. 3; Germiston, Witwatersrand, *Fenn* in *Nat. Herb.* 316; Beginzel, Standerton, *Burt-Davy* 1020, 3082; Meintjes Kop, Pretoria, *Fouche*; Derby Station, Marico, *Burt-Davy* 7170; Mariestad, *Pott* 5214; Downs, Zoutpansberg, *Junod* 4081.

"Occasionally grazed when growing among other grasses, but rather coarse."—*Burt-Davy*.

XXIX. **PASPALUM**, Linn. (161).

Spikelets orbicular to oblong, mostly decidedly plano-convex, falling entire from the short rudimentary pedicels, solitary or paired, secund and abaxial on the dilated or narrow rhachis of spike-like racemes; lower floret barren, reduced to its valve; upper floret ♂. Glumes: the lower typically suppressed, very rarely represented by a small scale; the upper more or less equal to the spikelet, rarely shorter or absent, convex, membranous, 3- or more-nerved. Lower floret: valve very similar to the upper glume, but usually flat or at least less convex, rarely subconcave, the middle nerve sometimes suppressed. Upper floret: valve chartaceous to crustaceous with firm margins, obtuse, emucronate, faintly nerved; valvule subequal to the valve and similar in substance, tightly embraced by the narrowly involute margins of the valve. Lodicules 2, minute, broadly cuneate. Stamens 3. Styles distinct. Stigmas laterally exerted near the tip of the floret. Grain tightly enclosed by the slightly hardened valve and valvule, more or less biconvex; scutellum orbicular-elliptic, shorter than half the grain; hilum subbasal, punctiform.

Mostly perennial grasses of varying habit.

P. distichum, Linn. (= *P. digitaria*, Poir., Stapf in Dyer, Flor. Cap., VII, 370).
Wonderboom, near Pretoria, *Nat. Herb. H.* 19604.

P. scrobiculatum, Linn., var. **Commersonii**, Stapf (in Prain, Flor. Trop. Afr., 573 = *P. scrobiculatum*, L., Stapf in Dyer, Flor. Cap., VII, 370).

Mosdene, Naboomspruit, Waterberg, *Galpin M.* 389; Middelburg, *Nat. Herb.* 302; Downs, Zoutpansberg, *Junod* 4099; Tzaneen, Zoutpansberg, *Sampson in Nat. Herb.* 304; Lydenburg, *Nat. Herb.* 306.

"Ditch grass," the Kodo Millet of India—a useful pasture grass in some localities. "Known to be poisonous and injurious to animals and man in India. The seed, especially the testa and pericarp, contain a narcotic poison. . . . Cattle should not be allowed to feed on it when it is ripening."—*Pammel*.

We have no records of poisoning from this grass in South Africa. Susceptible to ergot.

P. dilatatum, Poir.

Occurs as an alien, probably an escape from cultivation, in moist localities. It is largely cultivated as a pasture and hay crop, but is subject to attacks of ergot (*Claviceps Paspali*). Very good pasture grass for sour veld.

XXX. **ERIOCHLOA**, H. B. and K. (164).

Spikelets ovate-lanceolate to oblong, acute or acuminate, sometimes finely and shortly aristulate, slightly compressed from the back, falling entire from the pedicels, 2-nate or solitary, secund and abaxial on the triquetrous rhachis of more or less spiciform simple or compound racemously arranged racemes; lower floret ♂ or barren, upper floret ♀. Glumes very unequal; the lower reduced to a minute cupular rim clasping the callously thickened bead-like lowest internode of the spikelet, upper corresponding in outline and size to the spikelet, sometimes shortly aristulate, membranous, faintly 5-nerved, the sub-marginal nerves sometimes obscure. Lower floret: valve very like the upper glume, if not slightly shorter; valvule subequal to the valve, 2-keeled or reduced or, like the lodicules and flower, quite suppressed. Upper floret: valve chartaceous to almost crustaceous, glabrous or very minutely puberulous at the apex, faintly 5-nerved, with a fine barbellate mucro of varying length; valvule equal to the valve, 2-keeled, with moderately narrow flaps. Lodicules 2, broadly cuneate. Stamens 3. Styles distinct. Stigmas laterally exerted near the tips of the spikelets. Grain enclosed in its floret and the tightly appressed lower floret and upper glume, dorsally compressed; scutellum rather exceeding the middle of the grain; hilum subbasal, punctiform.

Perennial or annual; leaf-blades more or less flat, ligules reduced to a ciliate rim. Racemes peduncled or the upper subsessile, racemously arranged in a narrow panicle.



Plate IV.

Eriochloa Fouchetii, Stent.

A, Rachis of raceme with pedicels; B, Spikelet; C, Upper glume; D, Lower valve;
E, Upper valve; F, Pale; G, Pistil and stamens.

E. Fouchei, Stent, n. sp.

Gramen annua. Culmi erecti, vel geniculati, 4-7 nodi, simplices vel nodis inferioribus ramosi, compressi, glabri, internodii infimi 4-5 cm., cetera breviores, brevite exserti, vel supremi basim panicula inclusi. *Foliorum vaginæ* compressae, carinatae, tenuite striatae. *Ligulae* ad coronam dense ciliatam 1.5 mm. longa reducta. *Laminae* lineares, in apicem tenuem attenuatae, ad 8 mm. latae, 22 cm. longae, glabrae vel basim pubescente, planae vel complicatae; costa gracila, distincta, supra tenuite canaliculata, subtus carinata. *Panicula* angusta, ad 21 cm. longa, racemo pluris (ad 20), appressis, vel obliquo patulo, solitarius, vel 2-3 natis. *Rachis* communis tenuite sulcatis, minute pubescentis. *Racemi* ad 5 cm. longi, internodios excedens, brevite pedunculati, infimi saepe basim compositi; rachis circa 7 mm. latis, minute pubescentis, supra carina flexua, apex in spiculam terminens. *Pedicelli* plerumque 2-nati, longiore ad 2 mm. longi, carinam utroque alternis dispositus, ideo spiculae in ordines 4 videtae (in paucis racemis pedicelli solitarii ideo spiculae certe bi-seriatae), hirsuti, pilo longo-rigido albo, apices disciformes infra. *Spiculae* ad 4.5 mm. longae, ovato-lanceolatae, aristato-acuminatae, pallido-viridae, internodiis basim globuliformis, viridis, vel purpureus, 5 mm. diam.; gluma inferior membrana, cupula reducta; gluma superior ovato-acuminata, mucronis scabridis 4 mm. longis, 5-sub 7-nervis, quadrans superior glabrus, cetera sparse hirsuta. *Valva inferior* gluma superior similis, sed parce brevior, vacua, ne quidem palea minuta. *Valva superior* angusto-ovata, glabra sed apice minute hirsuto, tenuite rugosa, 2.5 mm. longa, 5-nerva, mucrona scabrida, 4 mm. longa; palea angusta, plana, dorso tenuite rugoso; antherae 3, purpurescens. Styli distincti.

Gezina, near Pretoria, *Fouche* 7. The plants growing in the open veld have been much browsed by stock and they exhibit a prostrate habit with ascending branched culms, while those within a fenced area where the land has been ploughed are taller; simple and erect, or only slightly geniculate from the lowest node.

This plant is very near to *E. acrotricha*, Hack. It differs from Hackel's description of that species in having longer spikelets and a longer panicle with more numerous racemes, spikelets in most of the racemes distinctly 4-seriate, and the mid-nerve of the leaf grooved above and prominent below. I have not seen an authentically named specimen of *E. acrotricha*, and it may be, as Dr. Stapf suggests, a polymorphic type that will include this species as well as *E. ramosa*, but this point can only be settled by the study of a wide range of material.

This is the first record that we have of the genus occurring in the Union of South Africa. It appears to be a good fodder grass and stock apparently relish it.

XXXI. UROCHLOA, Beauv. (166A).

Spikelets broad-ovate to elliptic- or lanceolate-oblong, awnless, usually more or less flattened or slightly depressed abaxially, convex on the back, falling entire from the pedicels solitary or 2-nate or in fascicles of 3-4, secund and abaxial on the more or less triquetrous rarely strap-shaped rachis of moderately slender or somewhat stout spiciform racemes; lower floret ♂ or barren, with a well-developed valvule; upper floret ♀. Glumes similar and subequal or more often dissimilar and very unequal in length, the lower being the shorter, upper resembling and more or less equalling the valve of the lower floret, 5-11- (mostly 7-nerved), with the nerves evenly distributed. Lower floret: valve 5-7-, rarely more-nerved, the inner lateral nerves somewhat distant from the mid-nerve; valvule subequal to the valve, with well-developed inflexed flaps and sharp, sometimes marginate, keels. Upper floret: valve elliptic to rotundate-elliptic in outline, very obtuse with a usually scabrid or barbellate mucro, crustaceous with firm margins, narrowly involute, faintly 5-7-nerved; valvule almost as long as the valve, 2-keeled, its sides tightly embraced by the valve all along, of the same texture as the latter. Lodicules 2, small, broadly cuneate. Stamens 3. Styles distinct. Stigmas plumose, laterally exserted upwards. Grain tightly enclosed by the more or less hardened valve and valvule, broadly to rotundate-elliptic, dorsally compressed, more or less flattened on both faces with broadly rounded

sides ; hilum subbasal, punctiform ; embryo half to over three-quarters the length of the grain.

Perennial or annual ; blades linear to lanceolate, flat ; ligules reduced to a ciliate rim ; racemes sessile or subsessile on a common axis, simple or nearly so ; rachis more or less triquetrous with a low almost straight or zigzag facial angle or keel, rarely strap-shaped ; pedicels solitary or in pairs, alternately to the right and the left of the facial angle, usually reduced to short disc-tipped stumps ; or if 2-nate, the primary slightly larger ; spikelets close, contiguous or slightly discontinuous, 2- or irregularly pluri-seriate, glabrous or hairy.

U. trichopus, Stapf (in Prain, Flor. Trop. Afr., IX, 589 = *Panicum trichopus*, Hochst., Stapf in Dyer, Flor. Cap., VII, 391).

Mosdene, Naboomspruit, Waterberg, *Galpin* M. 398 ; Pienaars River Station, Pretoria District, *Burt-Davy* 7042 ; Hector Spruit, *Kirk*.

"Only grows on old lands, and along roads, etc., but has the merit of being the first grass to become fresh and green in the early spring before the rains."—*Kirk*.

U. pullulans, var. *mosambicensis*, Stapf (in Prain, Flor. Trop. Afr., IX, 590).

Mosdene, Naboomspruit, *Galpin* ; Rooikop, Bushveld, Pretoria District, *Pole Evans* 155 ; Hamanskraal, Pretoria District, *Pole Evans* 394 ; Pienaars River, Pretoria District, *Pole Evans* 165.

"Very drought resistant ; . . . stock are very fond of it in the growing state ; . . . it has a spreading habit, except where it comes up very thickly, and there it grows erect."—*Galpin*.

U. helopus, Stapf (in Prain, Flor. Trop. Afr., IX, 595 = *Panicum helopus*, var. *glabrescens*, K. Schum., Stapf in Dyer, Flor. Cap., VII, 392).

Johannesburg, *Bryant* B. 6 ; Pretoria, *Burt-Davy* 789 ; Smitskraal, Bloemhof, *Burt-Davy* 12919 ; Potgietersrust, Waterberg, *Burt-Davy* 2224 and *Galpin* 8866 ; Hamanskraal, near Pretoria, *Burt-Davy* 1094 ; Shilovane, Zoutpansberg, *Junod* in *Gort. Herb.* 4682.

An annual weed, known as "sinande."

U. bulbodes, Stapf (in Prain, Flor. Trop. Afr., IX, 593).

Pyramid Estate, Potgietersrust, in moist shady places, *Galpin* 8868 ; Potgietersrust, *Burt-Davy* 2307.

XXXII. BRACHIARIA, Gris. (166B.)

Spikelets oblong to ovate- or elliptic-oblong, awnless, usually more or less flattened or slightly depressed, convex on the back, falling entire from the pedicels, 1-2-nate, more rarely in fascicles of 3 or more, secund and abaxial on the triquetrous or flat rachis of moderately slender or stout mostly spiciform racemes ; lower floret ♂ or barren, with a usually well-developed valvule, very rarely the latter suppressed. Glumes dissimilar and mostly very unequal in length, the lower being the shorter, upper resembling, and more or less equalling, the valve of the lower floret, 5-7- (very rarely 9-) nerved, with the nerves evenly distributed. Lower floret : valve 5-, very rarely 7-nerved, the lateral nerves placed towards the margins and distant from the middle nerve ; valvule usually only slightly shorter than the valve, with well-developed inflexed flaps or the latter vanishing above the middle. Upper floret : valve oblong to elliptic in outline, emucronate, though sometimes contracted into a small projecting point, more or less crustaceous or subcoriaceous with firm margins, narrowly involute, faintly 5-nerved ; valvule almost as long as the valve, 2-keeled, its sides tightly embraced by the valve all along, of the same texture as the latter. Lodicules 2, small, broadly cuneate. Stamens 3. Styles distinct. Stigmas plumose, laterally exerted from the upper part of the spikelet. Grain tightly enclosed by the more or less hardened valve and valvule, broad, oblong, or elliptic, dorsally compressed, more or less flattened on both faces with broadly rounded sides ; hilum subbasal, punctiform ; embryo half to over three-quarters the length of the grain.

Perennial or annual ; blades linear to lanceolate, usually flat ; ligules reduced to a narrow ciliate or ciliolate rim ; racemes usually sub-sessile and solitary on a common axis,

sometimes bare at the base owing to the arrest of spikelets, rarely truly peduncled and panicle (B. *poecoides*), simple or compound near the base, rarely to or beyond the middle; rachis filiform, triquetrous or more or less flattened and herbaceous with a wavy or zigzag midrib, which projects as a mostly acute keel on the face; pedicels solitary or in pairs, alternately to the right and the left of the facial angle or the midrib, if solitary, all short or very short, if paired, the primary slightly to very much longer; spikelets closely appressed, always 2-seriate in the plan, but frequently becoming 1-seriate by the dovetailing of the alternate spikelets of the closely approximate ranks, more or less contiguous with their sides or imbricate forming dense spike-like racemes, or distant by almost their own length or more, glabrous or hairy.

B. brizantha, Stapf (in Prain, Flor. Trop. Afr., IX, 531 = *Panicum brizanthum*, Hochst., Stapf in Dyer, Flor. Cap., VII, 386).

Mosdene, Naboomspruit, Waterberg, *Galpin* M. 399; Warmbaths, Waterberg District, *Burt-Davy* 1151; near Komatipoort, Black M'belusi to Komati, Barberton, *Burt-Davy* 10658 and 285; Skinners Court, near Pretoria, *Burt-Davy* 3555; Zeerust, Marico, *Hughes* in *Nat. Herb.* H. 321; also in tropical Africa.

A very promising pasture grass; birds are very fond of the seed, and on this account it is difficult to collect sufficient for sowing. "Large-seeded millet grass," frost-resistant.

B. mutica, Forsk. (?) (Stapf ex Prain, Flor. Trop. Afr., IX, 527).

Groenkloof, Pretoria, *Stent* in *Nat. Herb.* H. 21501.

This grass, which originally came from Warmbaths and which has been designated "Warmbaths grass," has never produced flowers. It, however, makes a dense and luxurious mass of vegetation, the details of which agree in every respect with the description of *Brachiaria mutica*, Forsk.; it also resembles exactly plants of Para grass of which we received roots some two years ago from Australia under that name.

The Penhalonga grass of Rhodesia is also apparently the same grass, and has never flowered either here or in Rhodesia.

It is a late grass, and susceptible to cold; can be recommended for soil erosion on account of its long runners.

B. nigropedata, Stapf (in Prain, Flor. Trop. Afr., IX, 535 = *Panicum nigropedatum*, Munro, Stapf in Dyer, Flor. Cap., VII, 388).

Mosdene, Naboomspruit, Waterberg, *Galpin* M. 397; Hamanskraal, Pretoria District, *Burt-Davy* 1096; Springbok Flats, Waterberg, *Burt-Davy* 1109; Kaffraria, Bloemhof, *Burt-Davy* 12974; Vierfontein to Schweizer Reneke, *Burt-Davy* 1625.

Krul gras—a sweet grass much relished by all stock.

B. serrata, Stapf (in Prain, Flor. Trop. Afr., IX, 537 = *Panicum serratum*, Spreng., Stapf in Dyer, Flor. Cap., VII, 388).

Mosdene, Naboomspruit, Waterberg, *Galpin* M. 395; near Nylstroom, Waterberg, *Burt-Davy* 2030; Downs, Zoutpansberg, *Junod* 4090; Skinners Court, near Pretoria, *Burt-Davy* 3811; Bushveld, Pretoria, *Reck, Govt. Herb.* 3531; Johannesburg, *Bryant* D. 33, C. 13; Beginsel, Standerton, *Burt-Davy* 1019; Heidelberg, *Burt-Davy* 3145; Vereeniging, *Burt-Davy* 7026; Schweizer Reneke, *Burt-Davy* 1666; Leeuwpoot, Carolina, *Burt-Davy* 7426; Potchefstroom, *Burt-Davy* 1061.

Of little value.

B. Isachne, Stapf (in Prain, Flor. Trop. Afr., IX, 552 = *Panicum Isachne*, Rott., Stapf in Dyer, Flor. Cap., VII, 390).

Springbok Flats, Waterberg, *Burt-Davy* 1140; Tzaneen, Zoutpansberg, *Sampson* in *Nat. Herb.* H. 4392; Skinners Court, near Pretoria, *Burt-Davy* 588; Beginsel Farm, Standerton, *Burt-Davy* 1793; Waterval Boven, *Burt-Davy* 1444; Vlaktefontein, near Amersfoort, Wakkerstroom, *Burt-Davy* 4055; Kolonies Plaats, Potchefstroom, *Burt-Davy* 9094.

A troublesome annual weed.

B. Marlothii, Stent. comb. nov. (= *Panicum Marlothii*, Hack., Stapf in Dyer, Flor. Cap., VII, 390).

Schweizer Reneke, Bloemhof, *Burt-Davy* 1672; Kaffraria, near Christiana, Bloemhof, *Burt-Davy* 11414.

B. arrecta, Stent. comb. nov. (= *Panicum arrectum*, Nees, Stapf in Dyer, Flor. Cap., VII, 393).

Spionkop, Lake Chrissie, Ermelo, *Bott and Bell* in *Nat. Herb. H.* 3401.

XXXIII. **ECHINOCHLOA**, Beauv. (166c).

Spikelets ovate to elliptic- or lanceolate-oblong, usually cuspidate or awned, very convex on the back, flat or slightly depressed in front, falling entire from the pedicels, 2-nate or clustered, secund and abaxial on the triquetrous rhachis of racemously arranged false spikes; lower floret ♂ or barren, upper floret ♀. Glumes unequal, membranous, the lower much shorter, more or less ovate from a clasping base, 3-5-nerved, often mucronate, the upper corresponding in length and outline to the spikelet (as seen from the back), very concave, 5-7-nerved, acute, cuspidate or cuspidate, rarely produced into a short awn. Lower floret equalling the upper glume (excluding cusps or awns); valve very similar to the upper glume, but flat or depressed on the back and often with a more pronounced cusp or an awn; valvule equal to the body of the valve, or in barren florets more or less reduced, hyaline, finely 2-keeled. Upper floret: valve ovate to elliptic-oblong, apiculate or obtuse, very convex on the back, subcoriaceous or crustaceous, polished, faintly 5-nerved, margins firm, involute up to near the tip, then flat, not embracing the tip of the valvule; valvule subequal to the valve and similar in substance, with rounded keels and flaps which thin out towards the flat slightly recurved tips. Lodicules 2, cuneate, fleshy. Stamens 3. Styles distinct. Stigmas plumose, exerted from near the tips. Grain broad-elliptic, dorsally flat, ventrally convex; hilum punctiform, subbasal; embryo elliptic-oblong or ovate, exceeding the middle of the grain.

Perennial, and often tall, or annual; blades linear from a slightly constricted or equally wide rarely much attenuated base; ligules 0 or represented by a transverse fringe of hairs; panicles of crowded or loosely arranged secund spiciform branches mostly bearing spikelets from the base or near it; spikelets more or less hispid on the nerves of the glumes, and the lower valve, rarely almost smooth.

E. Holubii, Stapf (in Prain, Flor. Trop. Afr., IX, 606 = *Panicum Holubii*, Stapf in Dyer, Flor. Cap., VII, 394).

Mosdene, Naboomspruit, Waterberg, *Galpin* M. 396; Vereeniging, *Brandmuller* 29; Vaal River, Heidelberg, *Burt-Davy* 12766; vlel at Hamanskraal, near Pretoria, *Burt-Davy*, 1645.

A grass of moist situations, much relished by cattle.

E. stagnina, P. Beauv. (Stapf in Prain, Flor. Trop. Afr., IX, 617 = *Panicum stagninum*, Retz., Stapf in Dyer, Flor. Cap., VII, 394).

Potchefstroom, *Smith* in *Nat. Herb. H.* 13975; Johannesburg, *Kling* in *Nat. Herb. H.* 8793; Pyramid Estate, near Potgietersrust, Waterberg, *Galpin* 8909.

E. colona, Link. (Stapf in Prain, Flor. Trop. Afr., IX, 607).

Potchefstroom, *Bell* in *Nat. Herb.* 7635; Hartebeestdam, near Pretoria, *Pole Evans* 699.

An annual, probably introduced, not very common, valued in India as a fodder-grass and for the grain, which in some districts is used by the natives for food.

XXXIV. **PANICUM**, Linn. (166).

Spikelets lanceolate to oblong, elliptic or orbicular in outline, symmetrical in profile, rarely somewhat oblique, falling entire or almost so, from the often elongated pedicels of a compound or decompound panicle, without a definite orientation towards the axis;

lower floret ♂ or barren, and then usually with a distinct valvule; upper floret ♀. Glumes more or less herbaceous-membranous; the lower usually shorter than the upper (often by very much), rarely equaling it, usually with 1 or 2 nerves or 1 or 2 very an an nerveless; upper as long as the spikelet, rounded on the back, 5-nerved. Lower floret: valve very similar to the upper glume and equally rounded and curved on the back (rarely less when the spikelets become oblique), 5-9-, rarely 3- or 11-nerved; valvule thinly membranous to subhyaline, subequal to the valve or more or less reduced, rarely suppressed. Upper floret: valve subcoriaceous to coriaceous with firm margins, obtuse to subacute, emucronate (see 1, *P. meyerianum*), faintly nerved; valvule subequal to the valve and of similar substance, tightly embraced by the more or less involute margins of the valve. Lodicules 2, broadly cuneate. Stamens 3. Styles distinct. Stigmas laterally exerted near the tip of the floret. Grain tightly enclosed by the hardened valve and valvule, dorsally compressed bi-convex to almost plano-convex; scutellum elliptic to ovate-elliptic, about half as long as the grain; hilum subbasal, punctiform.

Perennial or annual; rarely suffrutescent, of varying habit and size; leaf-blades mostly linear to linear-lanceolate, but in some groups ovate or filiform to subulate; panicles usually much divided and at least temporarily open; spikelets usually loosely scattered, glabrous or hairy.

P. deustum, Thunb.

The Pyramids, Pretoria, *Maynard* 21; Pilansberg, Rustenburg, *Gibbs* in *Nat. Herb. H.* 4342.

P. maximum, Jacq.

Skidders Court, Pretoria, *Burt-Davy* 3807; Pretoria, *Burt-Davy* 2190; Bushveld, Pretoria, *Reck* in *Nat. Herb. H.* 178; De Kroon, Brits, Rustenburg, *Stent* in *Nat. Herb. H.* 6121; Crocodile River, *Burt-Davy* 9284; Spitzkop Farm, Ermelo, *Burt-Davy* 13631; Warmbaths, Waterberg, *Burt-Davy* 1147; Pyramid, near Potgietersrust, *Galpin* 8871; Mosdene, Naboomspruit, Waterberg, *Galpin* M. 403; Springbok Flats, Waterberg, *Burt-Davy* 1136; Waterval Boven, Lydenburg District, *Burt-Davy* 1417; Tzaneen, Zoutpansberg, *Sampson* in *Nat. Herb. H.* 4450.

The "buffels gras" of the bushveld, more commonly known in other parts of the world as Guinea grass; an excellent pasture and hay grass.

The degree of hairiness varies considerably. *Burt-Davy* 1417 has very hairy sheaths and culms, and rather large, glabrous, purple spikelets. *Reck*, in *Nat. Herb. H.* 178 and *Galpin* 403 exhibit a glaucous form with smaller, greenish, pubescent spikelets, which may prove to be specifically distinct when more material can be collected and examined.

P. laevifolium, Hack.

Johannesburg, Observatory Hill, *Bryant* B. 41; Vereeniging, *Burt-Davy* 7518; Warmbaths, Waterberg, *Burt-Davy* 1152; Mosdene, Naboomspruit, Waterberg, *Galpin* M. 401; Nylstroom, Waterberg, *Driver* in *Nat. Herb. H.* 8947 and *Hilliard* in *Nat. Herb. H.* 4124; Pietersburg, Zoutpansberg, *Van Rooyen* in *Nat. Herb. H.* 9034; Barberton, *Lea* in *Nat. Herb. H.* 5875; Middelburg, *Ballard* in *Nat. Herb. H.* 6307; Schweizer Reneke, *Burt-Davy* 1677 and 1623; Ermelo Experiment Farm, *Burt-Davy* 3390; Teakworth, Standerton District, *Stent* in *Nat. Herb. H.* 19941; Platrand, Standerton, *Burt-Davy* 2356; Potchefstroom, in vlei lands, *Burt-Davy* 1071, 2375; Belfast, Lydenburg, *Burt-Davy* 1380; Christiana, Bloemhof District, *Burt-Davy* 12790.

"Roll gras" or "Blaauwzaad gras" of the Orange Free State.

An annual sweet grass, valuable as a hay and pasture grass, very fast growing. It is sometimes attacked by the parasite *Striga lutea*. *Stent*, H. 19941, shows a specimen of the *Panicum* bearing *Striga lutea* on its roots—both host and parasite are in a flourishing condition; there were, however, patches on the lands on which I collected this specimen where the *Panicum* was dwarfed and stunted, and not more than a few inches high on account of the attacking parasite.

- P. longijubatum**, Stapf (in Prain. Flor. Trop. Afr., IX, 718 = *Panicum proliferum*, var. *longijubatum* and var. *paludosum*, Stapf, in Dyer, Flor. Cap., VII, 406).
Pyramid Estate, Potgietersrust, *Galpin* 8872.

P. coloratum, Linn.

Mosdene, Naboomspruit, Waterberg, *Galpin* M. 405; near Station, Warmbaths, Waterberg District, *Burt-Davy* 860; Kolonies Plaats, Potchefstroom, *Burt-Davy* 9083; Machavie Station, between Potchefstroom and Klerksdorp, *Burt-Davy* 1480; Kaffraria, Christiana, Bloemhof, *Burt-Davy* 12869, 14125, 14134; Bloemhof, *Burt-Davy* 1509; Smitskraal, Bloemhof, *Burt-Davy* 12924.

P. minus, Stapf.

Henley-on-Klip, *Stent* in *Nat. Herb. H.* 21125; Christiana, Bloemhof District, *Burt-Davy* 11711.

Var. **planifolium**, Stapf.

Kaffraria, Christiana, Bloemhof District, *Burt-Davy* 14137; Potchefstroom, in black loam near furrow, *Burt-Davy* 1211.

"A useful grass; very closely resembling forms of *P. coloratum*."—*Burt-Davy*.

P. dregeanum, Nees.

Pyramid Estate, near to Potgietersrust, *Galpin* 8870.

P. natalensis, Hochst.

Groenkloof, Pretoria, *Phillips* H. 21686; Johannesburg, *Bryant* D. 13; Observatory Ridge, Johannesburg, *Burt-Davy* 3096; Pretoria, *Macdonald* in *Nat. Herb. H.* 5464; Henley-on-Klip, *Stent* in *Nat. Herb. H.* 2112; Billy's Vlei, Ermelo, *Burt-Davy* 9312; one mile north of Robinsons, Carolina, *Burt-Davy* 2973; Heidelberg, *Burt-Davy* 3143.

P. Ecklonii, Nees.

Belfast, *Stent* in *Nat. Herb. H.* 10627.

P. novemnerve, Stapf (in Prain, Flor. Trop. Afr., IX, 702).

In sandy places near Mara, north Zoutpansberg, *Schlecht.* 4614.

Dr. Stapf, in the Flor. Trop. Afr., IX, 705, has created a separate species for *Schlechter* 4614, and described it under the name of *Panicum arcuatum*. I cannot, however, find sufficient differences between *Schlechter*'s specimen and those Dr. Stapf has classified under *P. novemnerve* to warrant such distinction, and his description of the latter grass agrees well with *Schlechter*'s specimen in which the upper glume is more often than not 9-nerved. The arrangement of the spikelets is also not a constant character.

P. miliaceum, L.

Groenkloof, Pretoria, *Turner* in *Nat. Herb. H.* 10013; Pyramid, Pretoria, *Maynard* 21; Rustenburg, *Weeber* in *Nat. Herb.* 6621.

Indian buffels grass. Cultivated; there is no records of this grass occurring spontaneously in the Transvaal, except perhaps as an escape from cultivation.

P. obscurans, Stapf (*ex* Woodrow in Journ. Bomb. Nat. Hist. Soc., XIII, 434, 1901).

Pretoria, *Franks* in *Nat. Herb. H.* 10616; Wonderboompoort, Pretoria, *Mogg* in *Nat. Herb. H.* 9937; Crocodile River, *Burt-Davy* 9290.

The culms of this grass break off at the top node when the seeds are ripe, and the widely spread, straw-coloured panicle is blown over the veld. The seeds contain a great quantity of oil, and were responsible for seriously impeding the movements of trains, principally in the Pretoria, Witwatersrand, and Standerton Districts, where the tops of the grass were constantly being blown in great masses on to the railway line.

Another report of strange behaviour on the part of this *Panicum* comes from Krugersdorp, which suddenly received a shower of this grass which fell on the streets of the town like manna from the heavens above. The probable explanation of this phenomenon was

that masses of the grass had been collected in the veld by a passing whirlwind, commonly known in this country as a "dust devil," and this had carried the grass along, whirling it high into the clouds, and finally releasing it over Krugersdorp.

XXXV. *DIGITARIA*, Hall (166n).

Spikelets lanceolate to elliptic-oblong, flat or more or less concave in front, convex on the back, falling entire from the pedicels, usually 2-3- (more rarely 4-6-) nate, secund and abaxial on the triquetrous or flat rhachis of slender to very slender spiciform racemes; lower floret barren, reduced to the valve and a very minute rudimentary valvule, accompanied by equally minute lodicules; upper floret usually equal to the lower, ♂. Glumes very dissimilar, the lower a minute membranous scale or a very delicate readily disintegrating hyaline membrane, or sometimes quite suppressed, upper membranous, sometimes very thin, as long as the fertile floret to whose back it is appressed, or shorter to very short, 5- or more often 3-nerved, very rarely 1-nerved or almost nerveless, or 0. Barren floret: valve sometimes resembling the upper glume, but generally larger and determining the outline and size of the spikelet, 7-5-nerved; very rarely 3-nerved or reduced to a small scale, nerves parallel, prominent if not obscured by hairs. Fertile floret: valve chartaceous to subchartaceous with thin hyaline margins, faintly 3-nerved; valvule equal or subequal to the valve, embraced by it all along, finely 2-nerved, of the same texture. Lodicules 2, minute, broadly cuneate. Stamens 3. Styles distinct. Stigmas laterally exerted near the top of the floret. Grain tightly enclosed by the slightly hardened valve and pale, oblong, dorsally more or less compressed, plano-convex in cross-section, with rounded sides; hilum subbasal, punctiform; embryo usually less than half the length of the grain.

Perennial or annual, very rarely suffrutescent; blades linear to linear-lanceolate, usually flat and often more or less flaccid; ligules membranous; racemes sessile, digitate or more or less distant on a common axis, sometimes bare at the base owing to the arrest of spikelets, rarely truly peduncled and panicle, simple or sometimes compound near the base; rhachis triquetrous, lateral angles with narrow green margins or herbaceous wings or flattened with a terete midrib; pedicels unequally long; spikelets closely appressed and more or less imbricate or lax to very lax, usually silky though often apparently glabrous owing to the very tight application of the extremely fine hairs, rarely really glabrous.

D. monodactyla, Stapf.

Pretoria, *Macdonald* in *Nat. Herb.* H. 5408; Belfast, Middelburg, *Burt-Davy* 1345; Botsabelo, *Schlechter* 3781.

Var. *explicata*, Stapf (*ex* Stapf in *Prain, Flor. Trop. Afr.*, IX, 442).

Billy's Vlei, Ermelo, *Burt-Davy* 9254.

Macdonald and *Burt-Davy's* specimens, which I have classified as belonging to the type as limited by Stapf in the *Flor. Trop. Afr.* on account of the narrow convolute leaves, both have some of the basal leaves flat and with well-developed motor cells, and occasionally three lateral ribs on either side of the midrib.

D. argyrogapta, Stapf.

Potchefstroom Farm, Potchefstroom, *Burt-Davy* 1068; Kaffraria, Christiana, Bloemhof, *Burt-Davy* 14148; Springbok Flats, Waterberg, *Burt-Davy* 1141.

D. eriantha, Steud.

Mosdene, Naboomspruit, Waterberg, *Galpin* M. 393; Downs, Zoutpansberg, on open veld, *Junod* 4086; Uitgevallen, Heidelberg, *Burt-Davy* 13666; Vierfontein, Schweizer Reneke, Bloemhof, *Burt-Davy* 1639; Potchefstroom, *Burt-Davy* 11459.



Plate V.

Digitaria Smutsii, Stent.

A, Base of leaf with ligule ; B, Pair of spikelets ; C, Glumes ; D, Lower valve ; E, Scale like pale ; F, Upper valve ; G, Pale ; H, Pistil and stamens.

Var. *stolonifera*, Stapf.

Potchefstroom, *Burt-Davy* 2376; Hamanskraal, near Pretoria, *Burt-Davy* 1091.

A useful pasture grass. "Finger gras"; one of our best sweet grasses.

D. Smutsii, Stent, n. sp.

Gramen perenne, dense caespitosum, rhizoma obliquum, gemmis innovationalibus. *Culmi* erecti, geniculati ad 1.5 m. alti, glabri; nodi plurimi ramos florantes ferentes. *Foliorum vaginæ* glabrae, vel inferiores pilis tuberculis insidentibus conspersa, infimæ basis tomentosae. *Ligulae* membranaceae, 2-3.5 mm. longae. *Laminae* lineares, apice setaceo-acuminatae, ad 12 mm. latae, 50 cm. longae, culmorum folia plerumque breviora lataque, illa innovationum longiores angustiora, laeves, vel marginibus parce asperis, planae, subtus carinatae, nervis lateralibus primariis untrunque 5-7. *Racemi* 4-10, plerumque 8-10, sessiles, solitarii vel infimi verticillati ex axe communis, plerumque late patentibus, ad 15 cm. longi, plumbeo-viridi vel purpurecentes, inferiores saepe e basi ramis brevibus; rachis tenuis .5 mm. lata, anguste marginata, supra carinata; pedicelli binati, aliquando ternati, vel solitarii, longissimus, ad circa 7 mm. longus. *Spiculae* appressae, subimbricatae, anguste ovato-lanceolatae, 3.5 mm. longae, 7 mm. latae; *gluma inferior* brevissima, membranacea, enerva; *gluma superior* angusta, circa 1-2 mm. longa, 3 nervis, pilis bombycinis inter nervoset in marginibus; *palea* squama hyalina .5 mm. longa, rare longiore.

Doornkloof, Irene, near Pretoria, *Pole Evans* 217; Division of Pottery, Pretoria (cult.), *Stent* in *Nat. Herb. H.* 21418; Irene, *Burt-Davy* 3839; Uitgevalen, Heidelberg, *Burt-Davy* 13666; Hamanskraal, near Pretoria, *Burt-Davy* 1089.

Near to *D. eriantha*, Steud., but a taller, coarser grass, with much-branched culms; broader leaves, with 5-7 distinct lateral nerves and a prominent keel; racemes nearly always widely spreading on an elongated axis and with numerous short additional racemes at the base of the lower ones. The spikelets are often ternate, sometimes 4-5 on short branches, and the pedicels are usually long.

This grass has been frequently collected and distributed as *D. eriantha*. I had seen only the dried material till General Smuts drew my attention to it growing on his farm at Irene, and the difference in habit and general appearance between it and *D. eriantha* was obvious. It has since been cultivated at the Dry-land Station at Groenkloof, where it has done well and is proving a very promising grass.

D. setivalva, Stent, n. sp.

Gramen perenne, stolonifer. *Culmi* erecti, vel geniculati, 46-107 cm. alti, 3-5-nodis, simplices vel plerumque nodis ramatis; nodus superior longissimus vagina longa exsertus. *Foliorum vaginæ* tenuae, laxae, viridae, gracile sulcatae, hirsutae, pilis longis albis e tuberculis patentibus (*Galpin* M. 390 and 394) vel omnino glabrae (*Galpin* M. 392) vel tantum pauci nodi hirsuti, ceteri glabri (*Burt-Davy* 864); *ligulae* tenuae membranaceae, ovatae, integrae, vel tandem fimbriatae, ad 4 mm. longae. *Laminae* lineares, lanceolatae, base tenuite constrictae et rotundatae, in apicem setaceum attenuatae, glabrae vel exigue hirsutae, scaberulae; margines cartilaginei, stricti vel aliquantum crispis; costa tenua, nervis lateralibus inconspicuis. *Racemi* 5-11, digitati vel sub-digitati, erecti vel tenuites patenti, stricti, ad 20 cm. longi, rachis strictus vel tenuite flexuosus, marginibus anguste alatis, scaber, 6 mm. latus. *Spiculae* appressae, 3 mm. longae, haud imbricatae, acute acuminatae, pallide viridae vel flavescentes, hirsutae; *gluma inferior* parvissima obtusa, enerva; *gluma superior* angusta, acute acuminata, circa 2 mm. longa, 3-nervis, pilis appressis costa utrinque et cum marginibus longe molliteque ciliatis; *valva inferior* spiculam aequans, 7-nervis, pilis tenuis obtusis inter nervos e marginibusque; ordines interiores pilorum cum setis validis albidis vel flavibus nitentibus, acutis, mixti, setae pilique tandem patenti; *lodiculæ* et *palea* minutae; *valva superior* 3-nervis, valvam inferiorem fere aequans, sub-apiculata.

Mosdene, Naboomspruit, in black turf, *Galpin* M. 392; on loam formation, *Galpin* M. 390, 394, 391; Warmbaths, *Burt-Davy* 864; Springbok Flats, *Burt-Davy* 1122.

This resembles *D. marginata*, var. *fimbriata*, Stapf (*ex descr.*), but is a more robust grass and a perennial; the thick-walled, sharp-pointed bristles on the lower valves are constant in all the material examined. In *Burt-Davy* 1122, *Galpin* M. 390, 394, and 391, they are bright golden, while in *Burt-Davy* 864 and *Galpin* M. 392 they are whitish with a tendency to become yellow in some of the spikelets.

Stapf refers *Burt-Davy* 1122 to *D. eriantha* (Prain, *Flor. Trop. Afr.*, IX, 430), and notes that it is the only specimen he has seen with the stiff yellow bristles.

The same grass occurs in Southern Rhodesia (*Mundy* 2830), and Mr. Walters writes of it: "It is a native Rhodesian grass and when grown alone covers the ground well, being both perennial and stoloniferous. It has shown great promise as a pasture constituent."

***D. ternata*, Stapf.**

Belfast, Lydenburg, *Burt-Davy* 1375; Spionkop, Ermelo, *Burt-Davy* 9238; Volksrust, Wakkerstroom, *Burt-Davy* 7732.

***D. debilis*, Willd.**

Shilovane, Zoutpansberg, *Junod* in *Nat. Herb.* H. 367.

***D. horizontalis*, Willd.**

Potgietersrust, Waterberg, *Burt-Davy* 2233; Tzaneen, Zoutpansberg, *Sampson* in *Nat. Herb.* 368.

***D. marginata*, Link. (Stapf in Prain, *Flor. Trop. Afr.*, IX, 439).**

Pretoria, *Burt-Davy* 886; Rietvlei Farm, Belfast, Lydenburg, *Burt-Davy* 1262.

***D. longiflora*, Pers. (Stapf in Prain, *Flor. Trop. Afr.*, IX, 469).**

Downs, on veld, Zoutpansberg, *Junod* 4100; Tzaneen, Zoutpansberg, *Sampson* in *Nat. Herb.* H. 378.

***D. uniglumis*, Stapf (Stapf in Prain, *Flor. Trop. Afr.*, IX, 474).**

Downs, Zoutpansberg, *Junod* 4093; Meintjes Kop, Pretoria, *Burt-Davy* 3549.

I have not seen an authentically named specimen of this species, but the specimens quoted above agree with Stapf's description, except that the spikelets are slightly larger (2.25 mm.) and the roots and bases of the culms are densely covered with silky tomentose cataphylls, and the sheaths do not appear to break up into fibres. *Schlechter* 6901 from Sand River, distributed as *D. diagonalis*, is the same grass from a very different locality. It is possible that both the above grasses should be placed under Stapf's *D. diagonalis*, but the localities suggest rather an extension of the tropical species. More material is necessary before I can decide definitely on this point.

***D. tricholaenoides*, Stapf.**

Leeuwpoot, Carolina, *Burt-Davy* 7445; Ermelo, *Burt-Davy* 5464; Spitzkop, *R. Pott* 5206; Amersfoort, *Burt-Davy* 9049.

Good fodder grass, relished by sheep.

***D. Brazzae*, Stapf (in Prain, *Flor. Trop. Afr.*, IX, 447).**

Houghton Estate, Johannesburg, *Bryant* C. 37.

XXXVI. TRICHOLAENA, Schrad. (168).

Spikelets oblong, laterally compressed, more or less gaping, panicle, deciduous from capillary pedicels; lower floret usually ♂ or barren, upper ♀. Glumes very dissimilar or at least unequal, lower reduced to a minute scale or obsolete, very rarely half the length of the spikelet, somewhat remote from the upper; upper glume membranous, emarginate, mucous or finely mucronate or aristate from the sinus, 5-nerved, usually hairy. Valves very dissimilar, lower like the upper glume with a hyaline 2-nerved subequal pale, upper much smaller, thinly chartaceous, glabrous, shining, obtuse or subemarginate, obscurely 5-nerved, with an equal 2-nerved pale of similar substance. Lodicules 2, very small. Stamens 3. Style free, slender. Stigma densely plumose, laterally exerted. Grain



Plate VI.

Digitaria seticalca, Stent.

A, Lower glume ; B, Upper glume ; C, Lower valve ; D, Fertile floret.

oblong-ellipsoid, closely embraced by the valve and pale; hilum basal, punctiform; embryo about half the length of the grain.

Perennial, rarely annual; blades linear to setaceous; ligule a fringe of hairs; panicles open or contracted, often much divided, with capillary branchlets and pedicels, the latter with thickened tips; spikelets often completely enveloped by soft shining hairs, rarely pubescent or quite glabrous.

T. setifolia, Stapf.

Johannesburg, Observatory Hill, *Bryant* B. 36; Houghton Estate, *Bryant* C. 23; Pretoria, Wonderboom, *Burt-Davy* 8059; The Willows, *Burt-Davy* 4488; Eloff's Plantation, *Macdonald* in *Nat. Herb.* H. 5440; near Irene, *Burt-Davy* 30; Barberton Mts., *Burt-Davy* 337; Belfast, Lydenburg, *Burt-Davy* 1378; Waterval Boven, *Burt-Davy* 1423; Schoeman's Kloof, Lydenburg, *Burt-Davy* 7251; Spitzkop, Sabie, Lydenburg, *Burt-Davy* in *Nat. Herb.* H. 1573; Billy's Vlei, Carolina, *Mitchell* in *Nat. Herb.* H. 5666; Christiana, Bloemhof District, *Burt-Davy* 13227.

T. rosea, Nees.

Bezuidenhout Valley, Johannesburg, *Bryant* B. 1; Skinners Court, Pretoria, *Burt-Davy* 4233; Schweizer Reneke, Bloemhof, on the kopje, *Burt-Davy* 1668; Mosdene, Naboomspruit, Waterberg, *Galpin* M. 406; Tzaneen, Zoutpansberg, *Mogg* in *Nat. Herb.* H. 9452; Lydenburg, *Burt-Davy* 405; Komatipoort, *Burt-Davy* 375; Mooibank Settlement, Potchefstroom, *Jones* in *Nat. Herb.* H. 170.

Natal Red Top—a good fodder grass.

XXXVII. **XYOCHLAENA**, Stapf (168A).

Spikelets oblong or ovate-oblong, deciduous from capillary pedicels, more or less gaping, not gibbous, glabrous or pubescent; lower floret usually ♂ or barren; upper floret ♀. Glumes very unequal, the lower often reduced to a minute scale; upper 5-nerved, emarginate, muticous, or minutely mucronate, glabrous or pubescent, rarely shortly villous. Lower valve like the upper glume, with a hyaline 2-nerved subequal pale; upper valve smaller, membranous or chartaceous, glabrous, shining, obtuse or subemarginate, obscurely 5-nerved with an equal 2-nerved pale. Lodicules 2, very small. Stamens 2. Styles free, slender.

Perennial; blades linear to setaceous; ligule a fringe of hairs; panicles open or contracted, often much divided, with capillary branchlets and pedicels. Differs from *Tricholaena* in the non-gibbous upper glume and barren valves, which also lack the enveloping long silky hairs.

X. monachne, Stapf (Hook. Icon, Plt. V, 1, t. 3098 = *Tricholaena glabra*, Stapf, in Dyer, Flor. Cap., VII, 446).

Bushveld, Pretoria, *Reck* in *Nat. Herb.* H. 176.

Xyochlaena, sp. nov. (?)

Mosdene, Naboomspruit, Waterberg, *Galpin* M. 404.

XXXVIII. **OPLISMENUS**, P. Beauv. (169).

Spikelets oblong to ovate-oblong or lanceolate, awned from the glumes, falling entire from the pedicels, in small clusters on a common axis or 2-nate or solitary, second and abaxial on the angular rhachis of racemously arranged densely or more rarely interruptedly spiciform racemes; lower floret ♂ or barren, with a perfect or reduced or no valvule; upper floret ♀. Glumes similar in shape and texture, subequal, herbaceous to membranous, 3-7 nerved, both, at least the lower, awned, more or less keeled upwards. Lower floret exceeding the glumes; valve resembling them, 5-9-nerved, muticous or mucronate, or very shortly awned; valvule subequal to the valve, and 2-nerved when perfect. Upper

floret: valve oblong, broadly involute with firm margins, muticous, chartaceous to subcoriaceous; valvule equalling the valve and embraced by the valve all along. Lodicules 2; broadly cuneate, often very delicate. Stamens 3. Styles distinct, long. Stigmas terminally or subterminally exserted, plumose. Grain tightly enclosed by the somewhat hardened valve and valvule, oblong; hilum oblong, one-third to half the length of the grain.

Annual or more usually perennial; often weak grasses with slender many-noded ascending culms, the internodes of which have mostly a decurrent villous line axial to the subtending leaf; blades flat, thin, often slightly asymmetrical, often minutely cross-veined; lower and intermediate racemes mostly distant, the upper decreasing upwards and more or less approximate; the awn of the lower glume the longest.

O. africanus, Beauv., var. **simpex**, Stapf.

Houtbosch, Transvaal, *Rehmann* 5735*.

O. hirtellus, P. Beauv. (Stapf in Prain, Trop. Afr., IX, 631 = *O. africanus*, Beauv., Stapf in Flor. Cap., VII, 416).

Shilovane, Zoutpansberg, *Junod* in *Nat. Herb.* H. 4675.

XXXIX. **SETARIA**, Beauv. (171).

Spikelets ovate to oblong, falling entire from the pedicel, subtended by 1 to many persistent bristles (modified branchlets), which often form a one-sided involucre (see section *Ptychophyllum*), subsessile in contracted spike-like or more or less open panicles. Lower floret ♂, or reduced to the valve, and a more or less arrested pale; upper floret ♀. Glumes membranous, lower generally much smaller, usually 3-5, rarely 1- or 7-nerved, upper usually 5-, sometimes 7-nerved. Lower valve more or less exceeding and resembling the upper glumes; upper valve chartaceous to coriaceous, 5-nerved. Pales subequal to their valves or that of the lower floret more or less arrested, flat, 2-nerved, hyaline in the lower, of the same substance as the valve in the upper floret. Lodicules 2, broadly cuneate. Stamens 3. Styles distinct. Stigmas laterally exserted. Grain tightly enclosed by the hardened valve and pale, oblong or ellipsoid; hilum basal, punctiform or orbicular; embryo about half as long as the grain.

Perennials or annuals of various habit; ligules usually reduced to a ciliate rim, rarely a distinct membrane; panicle mostly cylindric, spike-like, dense, with the solitary or clustered spikelets on very short branches, which are more or less produced into bristles beyond the spikelets or divided into a one-sided bristly involucre at their base, or more or less open with elongate branches and more distant spikelets, often with or without subtending bristles in the same inflorescence; bristles always persistent.

S. sulcata, Raddi.

Skidders Court, Pretoria (cult. ?), *Burt-Davy* 611; Tzaneen, Zoutpansberg, *Sampson* in *Nat. Herb.* H. 4460; Shilovane, Zoutpansberg, *Junod* in *Nat. Herb.* H. 4667; Barberton, *Burt-Davy* 267.

Natal buffel grass; valuable pasture grass; horses are especially fond of it. Seeds are harmful to small birds.

S. lindenbergiana, Stapf.

Johannesburg, on hillsides at Rosebank, *Bryant* F. 6; Meintjes Kop, Pretoria, *Burt-Davy* 5608; Crocodile River, near Pretoria, *Burt-Davy* 207; slopes of the Magaliesberg, *Fouche* H. 21687.

“Kopje gras”; an excellent pasture grass.

S. nigrirostris, Dur. and Schinz.

Ermelo District, Ermelo, *Tennant* in *Nat. Herb.* H. 6927; Athol, near Amsterdam, *A. C. Macdonald* in *Nat. Herb.* H. 94; Vlaktefontein, Wakkerstroom District, *Burt-Davy* 4155; Beginsel Farm, Standerton, *Burt-Davy* 934; Leeuwpoort, Carolina, *Burt-Davy* 7380; Johannesburg, *Bryant* C. 8; Skidders Court, Pretoria, *Burt-Davy* 791; Tzaneen, Zoutpansberg, *Sampson* in *Nat. Herb.* 4382.

An excellent pasture grass for high veld.

S. Gerrardii, Stapf.

Skinnners Court, Pretoria, *Burt-Davy* in *Nat. Herb.* H. 4367; Struben's Farm, Pretoria, *Burt-Davy* 4481; Onderstepoort, Pretoria, *Native Aaron* in *Nat. Herb.* H. 7938; Mosdene, Naboomspruit, Waterberg, *Galpin* 408; Potchefstroom, *Burt-Davy* 2176; Pan Station, Middelburg, *Burt-Davy* 13336; Uitgevallen, Heidelberg, *Burt-Davy* 9158; Standerton, *Burt-Davy* 3316.

S. Holstii, Herrm. (in Rosen, *Beitrag. Biol., Pflanzen* X, 45).

Mosdene, Naboomspruit, *Galpin* M. 407; Malalane, Barberton, *Atmore* in *Nat. Herb.* H. 4727.

S. sp.

Tzaneen, Zoutpansberg, *Sampson* in *Nat. Herb.* H. 4393.

Belongs to an undescribed tropical species, the description and name of which will be published by Dr. Stapf.

S. perennis, Hack.

Kopjes at Sunnyside, Pretoria, *W. Macdonald* in *Nat. Herb.* H. 5549; Crocodile and Magalies Rivers, *Burt-Davy* 202; Koster River, Rustenburg, *Burt-Davy* 141.

S. flabellata, Stapf.

Eloff's Plantation, Pretoria, *W. Macdonald* in *Nat. Herb.* H. 5433; near Nylstroom, Waterberg, *Burt-Davy* 2032, 2025; Carolina, *Burt-Davy* 7375, 7403; Uitgevallen, Heidelberg, *Burt-Davy* 9171; Ermelo, *Burt-Davy* 5457; Panplaats, Pan Station, Middelburg, *Burt-Davy* 13309; Potchefstroom, Machavie Station, *Burt-Davy* 1479; Welverdiend Station, *Burt-Davy* 14580; Cawoods Hope, Bloemhof, *Burt-Davy* 12973.

S. aurea, A. Brown.

Skinnners Court, Pretoria, *Stent* in *Nat. Herb.* H. 4361, 3388, 5830; Johannesburg, *Bryant* C. 87; Sterk Hill, Lydenburg, *Burt-Davy* 451; Louis Trichardt, Zoutpansberg, *Fripp* in *Nat. Herb.* H. 10358; Tzaneen, Zoutpansberg, *Sampson* in *Nat. Herb.* H. 4403 and 4398; Ermelo, *Burt-Davy* 1659.

South African golden millet grass; good hay grass.

S. imberbis, R. & S.

Arcadia, Pretoria, *Burt-Davy* 11745; Johannesburg, *Bryant* D. 86, B. 13, C. 11; Shilovane, Zoutpansberg, *Junod* in *Nat. Herb.* H. 4674; Kolonies Plaats, Potchefstroom, *Burt-Davy* 9084; Rietvlei, Belfast, *Burt-Davy* 1263; Experiment Farm, Ermelo, *Burt-Davy* 7716.

An annual weed in cultivated lands.

S. italica, Beauv.

Houghton Estate, Johannesburg, *Bryant* C. 35; Standerton, *Burt-Davy* in *Nat. Herb.* H. 5064.

A cultivated species occurring sometimes as an escape.

S. verticillata, Beauv.

Pretoria, *Burt-Davy* 1040; Potchefstroom, *Burt-Davy* 9090, *Eldred* in *Nat. Herb.* H. 4220; Mosdene, Naboomspruit, Waterberg, *Galpin* M. 436; Rietvlei, Belfast, *Burt-Davy* 1257.

"Klitsgras"; a troublesome weed in cultivated lands.

XL. PENNISETUM, Pers. (175).

Spikelets oblong or lanceolate, solitary or in clusters of 2-4, subtended by arid deciduous with sessile or peduncled involucre of naked or plumose bristles (rarely reduced to a solitary bristle in section *Beckeropsis*), and arranged round the axis of spike-like, usually cylindric, panicles; lower floret ♂ or barren, with or without a pale; upper ♀. Glumes usually small and hyaline, lower sometimes suppressed, upper rarely half the length of the spikelets

or more, and then several- to 7-nerved. Valves equal or subequal, membranous to chartaceous, 5-7-nerved, or the lower more or less reduced, thinner, fewer-nerved. Pales subequal to the valve and of similar texture, 2-nerved, or more or less reduced in the lower floret. Lodicules small, usually in front and outside the pale, or 0. Stamens 3. Styles distinct, slender or connate. Grain enclosed by the slightly changed valve and pale (see also *P. typhoideum*), broadly oblong, slightly dorsally compressed to subglobose; hilum basal, punctiform; embryo large, half-three-quarters the length of the grain.

Perennial or annual; culms simple or often profusely branched; blades flat or convolute; ligules usually reduced to a ciliate rim or a fringe of hairs, rarely membranous; panicle spike-like, usually dense, branches very numerous all around the axis, very short, simple with a solitary spikelet, or scantily divided, with the spikelets in clusters of 2-5; the solitary spikelets or the clusters subtended by and deciduous with an involucre (very rarely a solitary bristle) of often very numerous and usually unequal scabrid or plumose, simple, rarely branched bristles.

P. spicatum, R. & S. (= *P. typhoideum*, in Dyer, Flor. Cap., VII, 432).

Nylstroom, Waterberg, *Burt-Davy* 1735, 1734.

Cultivated under the names of pearl millet and babala grass.

P. cenchroides, Rich.

Waterberg, near Nylstroom, *Burt-Davy* 2006; Warmbaths, *Burt-Davy* 2334; Mosdene, Naboomspruit, *Galpin* M. 435.

One of several grasses known as buffel grass; useful pasture plant.

P. macrourum, Trin.

Belfast, *Burt-Davy* 1463.

Occurs also in the Waterberg District, but not very common in the Transvaal.

P. sphacelatum, Dur. & Schinz., var. **tenuifolium**, Stapf.

Wonderboom, near Pretoria, *Burt-Davy* 8060.

P. Thunbergii, Kunth.

Pinedene, near Pretoria, *Burt-Davy* 2325; Rustenburg, *Burt-Davy* 140; Belfast, *Franks* in *Nat. Herb.* H. 9774.

Var. **Galpinii**, Stapf.

Pretoria, *Burt-Davy* 830; Vereeniging, *Brandmuller* 6.

XLI. POTAMOPHILA, R. Br. (191).

Spikelets laterally slightly compressed, on short or rather long pedicels, paniced; rhachilla jointed above the rudimentary basal glumes. Florets 3; lower two reduced to minute empty valves, uppermost ♂ or unisexual, with the organs of the other sex reduced. Glumes reduced to very minute rounded or truncate scales, or to an obscure entire or bilobed hyaline rim. Empty valves very small, hyaline, nerveless, subulate or elliptic and rounded or lobed; fertile valve membranous, 5-nerved, awnless, nerves raised, sometimes slightly winged. Pale 3-nerved; otherwise similar to the fertile valve. Lodicules 2, finely nerved. Stamens 6. Styles distinct. Stigmas feathery. Grain obovate, compressed, crowned by the thickened bases of the styles, enclosed by the unaltered glume and pale, free.

Rather tall aquatic grasses; blades flat; ligules membranous; panicle effuse or contracted.

P. prehensiles, Benth.

In bush, Cyprus Point, Zoutpansberg, *Junod* 4103.

XLII. ORYZA, Linn. (193).

Spikelets disarticulating below the glumes, 1-flowered, laterally compressed, and oblong, on the slender branches of an elongate rarely spiciform panicle; pedicels annular at the top.

Glumes scale or bristle-like or suppressed. Valve chartaceous obtuse or acute, awnless or awned, strongly 3-5-nerved, palea as long as the valve, keeled. Lodicules 2-lobed, rarely entire. Stamens 6; anthers linear. Styles short, free. Stigmas laterally exerted. Grain narrow, free or adnate to the valve and palea.

Tall, leafy grasses. Leaves long and flat. Ligule long and firmly membranous.

O. sativa, L.

Mosdene, Naboomspruit, Waterberg, in Nyl Vlei, *Galpin M. 444*.

Escape from cultivation (?).

XLIII. LEERSIA, Sw. (194).

Spikelets laterally compressed, very shortly pedicelled, paniced; rhachilla jointed above the rudimentary glumes. Floret 1, ♂. Glumes reduced to an obscure hyaline, entire, or 2-lobed rim. Valve 5-nerved, subcartilaginous, awnless, keel and margins rigidly ciliate. Pale narrow, 3-nerved, subcartilaginous, except at the hyaline margins, grooved along the outer nerves and tightly clasped by the inflexed margins of the valve, keel rigidly ciliate. Lodicules 2; fleshy, finely nerved. Stamens 6, 3, or 1. Styles distinct. Stigmas feathery. Grain ovate or oblong, compressed, embraced by the valve and the pale, free; embryo short.

Perennial; leaves narrow; panicle usually flaccid, with very slender branches.

L. hexandra, Sw.

Johannesburg, *Bryant C. 9*; Pretoria, *Burt-Davy 1167*; Mosdene, Naboomspruit, Waterberg, *Galpin M. 400*; Warmbaths, *Burt-Davy 1148*; Shilovane, Zoutpansberg, *Junod in Nat. Herb. H. 4677*; Beginsel Farm, Standerton, *Burt-Davy 1809*; Vereeniging, *Burt-Davy 7703*, *Brandmuller 5*.

Chiefly found in swampy or moist places. "Water kweek."

"An excellent, nourishing, and palatable grass in its early stages; cattle and horses relish it and grow fat on it."—*Brandmuller*.

XLIV. EHRHARTA, Thunb. (201).

Spikelets laterally compressed, paniced or racemed, sometimes solitary, pedicelled; rhachilla disarticulating below the valves, more or less obscurely produced. Florets 3; lower two reduced to empty valves, uppermost ♀. Glumes persistent, membranous. Valves 3, heteromorphous; the lower two empty, usually exceeding the glumes, more or less cartilaginous, often bearded, and the upper with a callous appendage at the base, awnless or awned; the uppermost fertile, smaller, thinner, awnless, sometimes with a knob-like appendage at the base forming a hinge with the appendage of the upper empty valve. Pale narrow, keeled, finely 2-nerved, nerves very close. Lodicules 2. Stamens 6 or 3, very rarely 1. Styles distinct, short. Stigmas plumose or brush-like, exerted above the base. Grain elliptic, much compressed; hilum a fine line almost as long as the grain; embryo about one-fifth of the grain.

Perennials or annuals of very varied habit, sometimes bulbous at the base or suffrutescent; blades flat or convolute, sometimes much reduced or suppressed; ligules membranous, usually short or reduced to a narrow rim; panicle or racemes sometimes very scanty or even reduced to solitary spikelets.

E. erecta, Lam.

Houtboschberg, *Burt-Davy 5120*; Rietvlei, Belfast, in shaded donga, *Burt-Davy 1244*.

XLV. PHALARIS, Linn. (204).

Spikelets laterally compressed, in contracted, more or less spike-like, panicles; rhachilla disarticulating above the glumes, not or obscurely produced beyond the terminal floret. Florets 3; the lower two minute, rudimentary, the uppermost ♂, enclosed by the

glumes. Glumes subequal, boat-shaped, keeled, keel often winged. Empty valves very small, subulate to lanceolate, membranous, with a callous base, or one or both reduced to a minute callous scale; fertile valve thin, ultimately rigid, 5-nerved, awnless, ovate, acute. Pale almost as long as the valve, 2-nerved (sometimes obscurely). Lodicules 2, hyaline. Stamens 3. Styles long, distinct. Stigmas plumose, exserted from the top of the spikelet. Grain much compressed, ovate, free, enclosed by the valve and pale; hilum oblong, short; embryo equalling one-fourth the length of the grain.

Annuals or perennials; leaves flat; panicle terminal, stiff, spike-like, subcapitate or interrupted and lobed; pedicels very short.

P. minor, Retz.

Kolonies Plaats, Potchefstroom, *Burt-Davy* 9095.

Introduced with agricultural seeds.

P. arundinacea, Linn.

Wenmershoek, Lydenburg District, *Burt-Davy* 7692; Vlaktefontein, near Amersfoort, *Burt-Davy* 4063.

Reed canary grass. "Makes good hay if cut before flowering."—*Burt-Davy*.

P. canariensis, L.

Pretoria, *Burt-Davy* 792; Brugspruit, Middelburg, *Cooper* in *Nat. Herb.* H. 4165; Zeerust, Marico, *Frost* in *Nat. Herb.* 6041; Beginsel, Standerton, *Burt-Davy* 3154.

Canary grass; introduced.

P. paradoxa, Linn. (Sp. Pl., ed. II, 1665).

Onderstepoort, Pretoria, *Parkes* in *Nat. Herb.* H. 4998; De Kroon, Brits, Rustenburg District, *Ras* in *Nat. Herb.* H. 5982.

An annual weed—not very common.

XLVI. ANTHOXANTHUM, Linn. (205).

Spikelets oblong to narrow-lanceolate, slightly laterally compressed; rhachilla disarticulating above the upper glume, not produced beyond the uppermost floret. Florets 3, heteromorphous, the lower two ♂ or barren, the terminal ♀. Glumes persistent, membranous, 1–3-nerved, keeled, acuminate; upper longer. Lower two valves equal and very similar, oblong, emarginate, membranous, strongly laterally compressed, 5–7-nerved, keeled, hairy, awned, awn of the lower valve short, from a third-half way below the tip, of the upper longer, kneed, from near the base, rarely from the middle; terminal valve much shorter than the lower two, broadly elliptic, very thin, delicately 7–1-nerved. Pales of the lower two florets, if present, 2-keeled, of the terminal 1-nerved. Lodicules 0. Stamens 3 in the ♂, 2 in the ♀ florets. Styles distinct, long. Stigmas long, exserted from the top of the spikelet, plumose. Grain ovoid, slightly laterally compressed; hilum punctiform; embryo quarter the length of the grain.

Perennial or annual; blades flat, usually flaccid; panicle slender, very narrow or spike-like, sometimes reduced to scanty racemes; sweet-scented.

A. odoratum, L.

Lions Glen, Amsterdam, Ermelo District, *Buchanan* in *Nat. Herb.* H. 6152.

"Sweet vernal"; probably an escape from cultivation.

XLVII. ARISTIDA, Linn. (208).

Spikelets 1-flowered, narrow, paniced, rhachilla disarticulating above the glume, not produced. Glumes usually persistent, narrow, 1–3-nerved, muticous or mucronate, awnless. Valve convolute, cylindric or oblong-cylindric, 3-nerved, awned rather rigid, tips gradually tapering or minutely bilobed, sometimes jointed at or above the middle; callus villous, shortly bearded, usually pungent; awn nearly always 3-partite from the base or above the

simple base (stipitate), very rarely simple, continuous with the valve or disarticulating from it or deciduous with a portion of the valve, foot straight or twisted bristles plumose or the lateral or all naked. Pale small, oblong, 2-nerved or nerveless. Lodicules 2, finely nerved. Stamens 3. Ovary glabrous. Styles distinct, short. Stigmas plumose, laterally exerted. Grain slender, cylindric or oblong-cylindric, terete, sometimes grooved, tightly embraced by the valve; hilum linear, almost as long as the grain; embryo short or long.

Annual or more often perennial; tufted, usually with more or less wiry culms; blades narrow, usually convolute; ligule usually a line of very short hairs; panicle varying from spike-like to effuse.

A. adscensionis, L.

Bushveld, Pretoria, *Reck* in *Nat. Herb.* H. 185; Potgietersrust, Waterberg, *Burt-Davy* 2246; Wonderboompoort, Pretoria, *Mogg* in *Nat. Herb.* H. 9940; Pyramid Estate, Potgietersrust, Waterberg, *Galpin* 8892.

A. scabrivalvis, Hack.

Skinner's Court, Pretoria, *Stent* in *Nat. Herb.* H. 3379; Mosdene, Naboomspruit, Waterberg, *Galpin* M. 427; Tzaneen, Zoutpansberg, *Sampson* in *Nat. Herb.* H. 4429; Pyramid Estate, Potgietersrust, Waterberg, *Galpin* 8891.

A. junciformis, Trin. & Rupr.

Arcadia, Pretoria, *Burt-Davy* 7494; Mosdene, Naboomspruit, Waterberg, *Galpin* M. 426, 423; Henley-on-Klip, *Stent* in *Nat. Herb.* H. 21135; Billy's Vlei, Ermelo, *Burt-Davy* 9267; Lake Chrissie, Ermelo, *Hamilton* in *Nat. Herb.* H. 5913, H. 994; Uitgevalen, Heidelberg, *Burt-Davy* 9185; Christiana, Bloemhof, *Burt-Davy* 13057, 14146.

Some of the species quoted above have been distributed as *A. angustata*, Stapf, but after careful examination of all our material I can find no constant characters on which to separate the two species *A. junciformis* and *A. angustata*. The slight compression of the culms is more noticeable in some specimens than in others, but is not correlated with other distinctive characters. The length of the awns is variable as is also the character of the glumes. I find long mucronate and almost emucronate glumes on the same plant. The inconspicuous nodes of the sheaths, with the swollen and often protruding culm nodes, seems to be a fairly constant character in individual plants and is often correlated with much-branched culms, but not always. I have not seen Stapf's type of *A. angustata*, but *Galpin* 6901, from Maclear, Cape Province, which is identified as that species and which identification (according to the label) has been confirmed by Stapf, has these same characteristic nodes.

A. sciurus, Stapf.

Waterval Boven, Lydenburg, *Burt-Davy* 1418 and 1449; between Machadodorp and Carolina, *Mundy* in *Nat. Herb.* H. 4292A.

A. Burkei, Stapf.

Klerksdorp, Potchefstroom, *Weeber* in *Nat. Herb.* H. 5648; Henley-on-Klip, *Stent* in *Nat. Herb.* H. 21121; Uitgevalen, Heidelberg, *Burt-Davy* 9161 and 9184; Christiana, Bloemhof, *Burt-Davy* 13030.

A. bipartita, Rupr. & Trin.

Waterval Boven, Lydenburg, *Burt-Davy* 1443B; Uitgevalen, Heidelberg, *Burt-Davy* 9125.

A. congesta, Roem. & Schult.

Johannesburg, *Bryant* D. 47; Germiston, near Johannesburg, *Fenn* in *Nat. Herb.* H. 8703; Lake Chrissie, Ermelo, *Hamilton* in *Nat. Herb.* H. 5914; Crocodile River, Rustenburg, *Burt-Davy* 9302; Mosdene, Naboomspruit, Waterberg, *Galpin* M. 421; Springbok Flats, Waterberg, *Burt-Davy* 1112; Zoutpansberg, *Junod* in *Nat. Herb.* H. 4662; Smitskraal, Bloemhof, *Burt-Davy* 10368; Christiana, Bloemhof, *Burt-Davy* 1654.

A. barbicollis, Trin. & Rupr.

Arcadia, Pretoria, *Burt-Davy* 3928; Skinners Court, Pretoria, *Junod* in *Nat. Herb.* H. 4519; Mosdene, Naboomspruit, Waterberg, *Galpin* M. 422; downs, Zoutpansberg, open veld, *Junod* 4078; Christiana, Bloemhof, *Burt-Davy* 13031.

A. sieberiana, Trin.

Mosdene, Naboomspruit, Waterberg, *Galpin* M. 425; Christiana, Bloemhof, *Burt-Davy* 13030A.

A. vestita, Thunb.

Meintjes Kop, Pretoria, *Burt-Davy* 4514; Billy's Vlei, Ermelo, *Burt-Davy* 9375.

A. spectabilis, Hack.

Kuduspoort, Pretoria District, *Rehmann* 4695*.

There is nothing in the National Herbarium that agrees with Hackel's description of this species, and I have not seen Rehmann's specimen on which he founded it.

A. sp.

Warmbaths, *Burt-Davy* in *Nat. Herb.* 2407.

This resembles *Aristida stipoides*, var. *meridionalis*, Stapf, *ex descr.*, but the spikelets are dark purple brown and the lower sheaths densely coated with fugacious wool.

A. stipoides, Lam.

Pyramid Estate, Potgietersrust, Waterberg, *Galpin* 8890.

A. uniplumis, Licht.

Mosdene, Naboomspruit, Waterberg, *Galpin* M. 424; Schweizer Reneke, Bloemhof District, *Burt-Davy* 1627; near Christiana, Bloemhof, *Burt-Davy* 12975, 10123.

XLVIII. **ORYZOPSIS**, Mich. (210).

Spikelets ovoid or lanceolate, usually awned, loosely panicked; rhachilla disarticulating above the glumes, not continued beyond the floret. Floret 1, ♀, shorter than the glumes. Glumes equal or subequal, persistent, usually acute or subacuminate, thin, 3-9-nerved, side nerves often very short. Valve convolute, more or less flattened from the back, ovate to obovate or lanceolate, 5- (very rarely 3-) nerved, rather rigidly membranous to coriaceous, tips obscurely 2-lobed; callus very short and broad, obtuse; awn, if present, from the minute sinus of the tip, jointed on the valve and easily deciduous, bristle-like, naked. Pale almost as long as the valve or rather shorter, 2-nerved. Lodicules 2, rarely 3, hyaline. Stamens 3. Ovary glabrous. Styles distinct, short. Stigmas plumose, laterally exserted. Grain tightly enclosed by the hardened valve and pale, oblong, ovoid or ellipsoid, or obovoid, terete; embryo small; hilum filiform, shorter than the grain, often obscure.

Perennial; tufted; blades linear, usually long, flat, flaccid; ligules membranous; panicles effuse, or more or less contracted, always very lax, often nodding.

O. sp.

Malta, in gorge, Zoutpansberg, *Junod* 4432.

XLIX. **PSEUDOBROMUS**, K. Schum. (216).

Spikelets lanceolate, scarcely compressed, pedicelled, panicked; rhachilla disarticulating above the glumes, produced beyond the base of the floret into a fine bristle. Floret 1, ♀, exserted from the glumes. Glumes persistent, slightly unequal, lanceolate to oblong, 1-3-nerved. Valve lanceolate in profile, rounded on the back, involute, passing into a straight awn or with the awn subterminal, subherbaceous, 3-nerved; callus very short, obtuse, glabrous. Pale equalling the valve, 2-keeled, entire. Lodicules 2, hyaline, unequally

2-lobed. Stamens 3. Ovary oblong, pubescent at the top. Styles distinct, very short. Stigmas slender, plumose, laterally exserted. Grain unknown.

Perennial; blades flat, broad-linear, flaccid; ligules membranous; panicle large, lax, nodding.

P. africanus, Stapf.

Houtbosch, *Rehmann*, 5732*.

L. SPOROBOLUS, R. Br. (230).

Spikelets usually very small, variously paniced, continuous on the pedicels; rachilla more or less readily disarticulating above the glumes, not continued, or very rarely produced into a bristle. Floret 1, ♀. Glumes 2, delicately membranous, lower usually smaller, nerveless, upper 1-nerved, falling away one after the other. Valve more or less resembling the upper glume, 1-nerved or more or less distinctly 3-nerved. Pale usually almost as long as the valve, 2-nerved, folded between the nerves, often split by the maturing grain. Lodicles 2, small, broadly cuneate, glabrous, thin. Stamens 3, rarely 2. Ovary glabrous. Styles short, distinct, terminal. Stigmas plumose or subaspergilliform. Grain free, falling out or retained and dehiscing; pericarp thin, usually swelling in water, rigid, dehiscing, or the inner layers mucilaginous when wetted, and adherent, or the whole pericarp adnate and indistinct; hilum small, punctiform, basal; embryo rather large.

Annuals or perennials of various habit; ligules reduced to a ciliate or ciliolate rim; panicles contracted to spike-like, or more or less open, sometimes extremely lax; spikelets mostly $\frac{1}{2}$ –1 lin. long.

S. festivus, var. **stuppens**, Stapf.

Pretoria District, Claremont, *Kresfelder* in *Nat. Herb.* H. 20834; Wonderboom, *Burt-Davy* 3343, 7148, 2683; Irene, *Burt-Davy* 14656; *Pole Evans* £20 ar d in *Nat. Herb.* H. 21223; Johannesburg, *Burt-Davy* 7296; Marikana, Rustenburg District, *Burt-Davy* 161; near Nylstroom, Waterberg District, *Burt-Davy* 2023, 2068.

S. festivus, Hochst., var. **fibrosus**, Stapf [*Chevalier* in Sudania, 142, 155 (1911)].

Springbok Flats, Waterberg District, *Burt-Davy* 1111.

S. discosporus, Nees.

Pretoria District, Kaalfontein, *Mogg* 3740; Irene, *Burt-Davy* 14657; Bloemhof District, near Christiana, *Burt-Davy* 11409, 12778, 11389, 11233.

S. Ludwigii, Hochst.

Christiana, Bloemhof District, *Burt-Davy* 12809, 12950, 12498.

S. centrifugus, Nees.

Spionkop, Ermelo, *Burt-Davy* in *Nat. Herb.* H. 9236; between Machadodorp and Carolina, *Mundy* in *Nat. Herb.* H. 4286.

S. ambriatus, Nees.

Near Machavie Station, Potchefstroom, *Burt-Davy* 1476; Schweizer Reneke, *Burt-Davy* 1684, 1636, 1691; Fourteen Streams, Bloemhof, *Burt-Davy* 1580; Kaffraria, Christiana, *Burt-Davy* 14160, 12765, 13054, 12758, 13090.

Var. **latifolia**, Stent, var. *nov.*, a more robust form, with usually broader and longer panicles and flat glaucous leaves up to 12 mm. broad = *Sporobolus Rehmanni*, Hack. (in part).

Boschveld, at Klippan, *Rehmann* 5373 (in *Herb. Alb. Mus.*); Mosdene, Naboomspruit, Waterberg, *Galpin* M. 460, 461; Hamanskraal, Pretoria District, *Burt-Davy* 1086.

The type occurs freely in the dry and sandy regions of the grass and thorn veld of the southern and south-western portions of the Transvaal. It is plentiful in association with *Eragrostis* spp. in parts of Bechuanaland and on the high veld.



Plate VII.

Sporobolus Smutsii, Stent.

A, Lower glume; B, Upper glume; C, Valve; D, Pale (flattened out);
E, Pistil and stamens; F, Ligule.

The variety is a bushveld form that also occurs in Natal and probably extends north into the tropical regions.

Rehmann's 5373, on which Hackel founded this species (*S. Rehmannii*), has hairy leaves and a narrow panicle. I have seen no other specimen like it. Stapf (in Dyer, Flor. Cap., VII, 585) has kept *S. Rehmannii* as a distinct species and has amplified Hackel's description to include all the glabrous broad-leaved forms of the bushveld and Natal. Critical examination of a number of specimens ranging from *S. fimbriatus sensu stricto* through all variations of width of leaf and panicle to the broad-leaved and robust form of the bushveld, has convinced me that this latter is only a climatic and edaphic variety of *S. fimbriatus*.

A very early grass, useful for spring grazing.

***S. indicus*, R. Br., var. *laxus*, Stapf.**

Johannesburg, common along roadsides, *Bryant* B. 23; Carolina, *Burt-Davy* 2955; Sterk Hill, Lydenburg, *Burt-Davy* 478.

The type apparently does not occur within the limits of the Transvaal.

***S. pyramidalis*, Kunth. (Flore d'Oware, ii, p. 36).**

Springbok Flats, Waterberg, *Burt-Davy* 1137; Mosdene, Naboomspruit, *Galpin* M. 458; Lydenburg, *Burt-Davy* 414.

***S. robustus*, Kunth. (Rev. Gram., ii, p. 425).**

Messina, Zoutpansberg, *Pole Evans* in *Nat. Herb. H.* 13113.

***S. pectinatus*, Hack. (Oestern. Bot. Zeitschr., L. iii, 198).**

Derdepoort, Pretoria, *Fouche* 302; near Observatory, Johannesburg, *Burt-Davy* 3097; Carolina, *Burt-Davy* 2990 and 7736; Zoutpansberg, downs, open veld, *Junod* 4091.

***S. Smutsii*, Stent, n. sp.**

Gramen perenne; culmi decumbentes ascendentes, glabri, pluribus nodis saepe ramati; radicibus e nodis brevibus inferioribus. Innovationes steriles, saepe longae, plures atque breviter nodatae, foliatae; *foliorum vaginæ* firmæ, carinatae, arctae, glabrae, ore barbato marginibusque ciliatis exceptis, vel setis e tuberculis inspersae, tenuiter striatae; margines crassi, cartilaginei, pectinatique.

Panicula erecta, ovata, lanceolata, acuta (raro constricta spiciformaque), 2-4 cm. lata, 8-10 cm. longa. Rami verticillati vel superiores \pm inspersi; infimi ad 3.5 cm. longi, nudi a base .5-1.25 cm., plerumque ascendentes; superiores patenter ascendentes. Ramuli breves, ad 3 mm. longi, \pm secundi, appressi. Pedicelli brevissimi. *Spiculæ* 1.7-2 mm. longae, ablongae, obtusae; *gluma inferior* parva .6 mm. longa, enerva, obtusa; *superior* spiculam aequans, 1-nerva, acuta vel sub-acuta, navicularis carina obtusa; *valva* glumae superioris similis, sub-acuta, 1-nerva; *palea* extensa truncata; *antherae* 3, 1.25 mm. longae; *lodiculæ* truncatae, minutae.

Rooikop, Bushveld, Pretoria District, *Pole Evans* 590, 271, 536, 556; Leeuwkraal, *Pole Evans* 668.

A very characteristic grass, with its decumbent ascending habit and short, broad, flat leaves on leafy runners. Dr. Pole Evans reports it as being very plentiful on the adjoining farms Rooikop and Leeuwkraal, but it has, so far, not been reported from any other locality.

It has little agricultural value.

***S. nitens*, Stent, n. sp.**

Gramen perenne, rhizomata obliquo. *Culmi* erecti vel prostrati ascendentes saepe radicibus ramisque e nodis inferioribus, coarcti, glabri, nitentes, 1-2 nodis, 13-30 cm. longi. *Foliorum vaginæ* arctae, strictae, laeves, glabrae, praeter margines saepe ciliatos, vaginæ basis breviores compressae, pallidae, firmissimae, nitentes, persistentes; *ligula* corona densa pilorum formata; *laminæ* ad 6 cm. longae, 7 mm. latae, basis rotundatae et plus minus amplexantes, apicem obtusum vel subacutum versus attenuatae, planae, firmissimae, tenuiterque striatae; glabrae, vel paucis setis e tuberculis ortis inspersae, marginibus cartilagineis minute pectinata ciliatis. *Panicula* ovata ad lanceolata, 6-10 cm. longa,

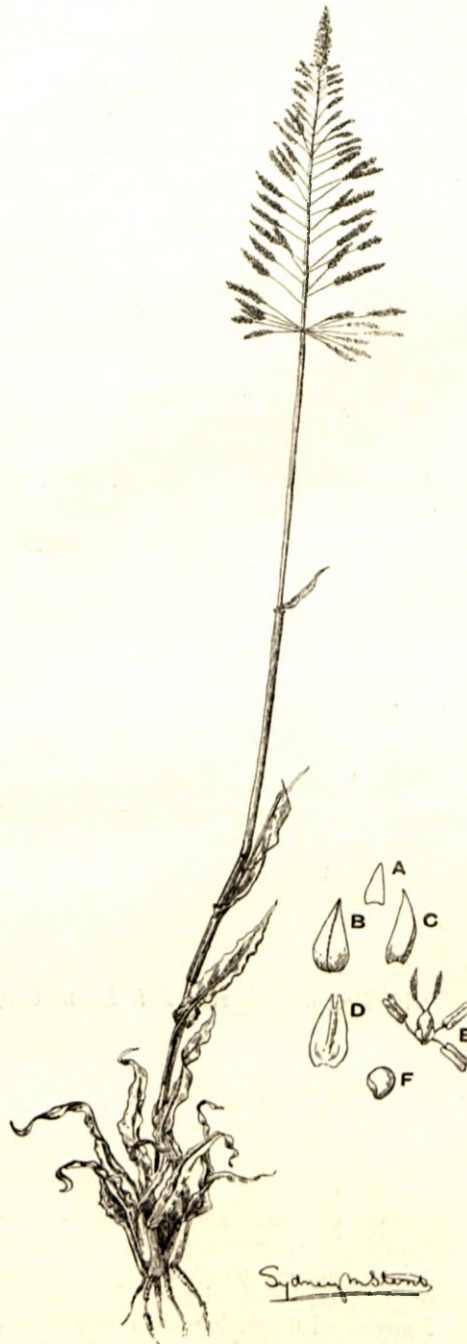


Plate VIII.

Sporobolus nitens, Stent.

A, Lower glume ; B, Upper glume ; C, Valve ; D, Pale ; E, Pistil
and stamens ; F, Caryops.

2.5-4 cm. lata. *Rami* infimis verticillati ascendentesque, raro pauci vel omnes patentes, ceteri solitarii, vel binati, racho spirale depositi, per $\frac{1}{2}$ - $\frac{3}{4}$ longitudinis indivisi, rami supremi brevissimi, e basi divisi, excepti; *ramuli* brevissimi, plus minus secundi, appressi 1-5 spiculati; *pedicelli* brevissimi. *Spiculae* 1-5 mm. longae; *gluma inferior* ablorga, lanceolata, acuta, vel sub-acuta, enervis, 1 mm. longa; *gluma superior* 1.5 mm. longa, ovato-acuminata, valide uninerva, carina minute pectinato, ciliata; *valva* glumam superiorem equale, vel pauce longior; valide uninerva, acute acuminata, laeva; *palea* valvam equale, lata, apicem bilobum versus attenuata, mix ad basim findata; *antherae* 3, rubescentes, circa .4 mm. longae; *lodicae* ovatae, parvissimae; *caryopsis* ovata, vel rotundata; pericarpium in aquam tumentum.

In the plain at the foot of the Magaliesberg Mountains, *Schlecht* 3679; Rooikop Bushveld, Pretoria District, *Pole Evans* 667; Gezina, Pretoria, *Fouche* and *Stent* in *Nat. Herb. H.* 21445; between Warmbaths and Nylstroom, *Pole Evans* 691.

Near to *S. Smutsii*, from which it differs in the hard, shining, lower sheaths, the spiral arrangement of the branches of the panicle, the densely contracted and spike-like tips of the panicle and of the branches—and the distinctly and acutely bilobed tip to the pale. Useful as a crop for sheep, but otherwise of little agricultural value.

LI. AGROSTIS, Linn. (242).

Spikelets from less than 1 lin. to $2\frac{1}{2}$ lin. long, panicked; rhachilla not continued beyond the floret or produced into a minute point or short delicate bristle, glabrous or shortly hairy. Floret 1, ♂, shorter than the glumes. Glumes equal or sub-equal, usually lanceolate and acute, rarely oblong and obtuse, awnless, membranous, usually 1-nerved, keeled. Valve broadly oblong, delicately membranous, glabrous or hairy, usually truncate, 5- (rarely 3-) nerved, awned from the back or awnless; side-nerves evanescent below, often excurrent into fine mucros or bristles; callus very small, glabrous or minutely hairy or rarely bearded. Pale delicate, hyaline, usually shorter than the valve or very short or obsolete, 2-nerved or nerveless. Lodicules 2, lanceolate, delicately hyaline. Stamens 3. Ovary glabrous. Styles distinct, very short. Stigmas plumose, laterally exerted. Grain free, enclosed in the scarcely altered floret, oblong, more or less dorsally compressed, grooved in front, rarely subterete; embryo short; hilum punctiform, basal.

Annuals and perennials, of varying habit; blades usually flat, often flaccid; ligules membranous; panicle usually much divided, often delicate, more or less effuse or contracted, rarely spike-like; branches and branchlets fine to very fine; spikelets usually very numerous, much gaping, at least, temporarily.

A. natalensis, Stapf.

Spionkop, Ermelo District, *Burt-Davy* 9232; Belfast, Lydenburg, *Burt-Davy* 1328, 1277.

A. lacnantha, Nees.

Hartebeestnek, Pretoria, *Burt-Davy* 770; near Nylstroom, Waterberg, *Burt-Davy* 4165; Lake Chrissie, Ermelo, *Mundy* in *Nat. Herb. H.* 4283; Lydenburg, along water-courses, *Burt-Davy* 415; Wonderfontein, Marico, *Burt-Davy* 7591; Potchefstroom, *Burt-Davy* 1765.

A. suavis, Stapf (Kew Bull., 1908, 227).

Spionkop, Ermelo, *Burt-Davy* 9235.

LII. CALAMAGROSTIS, Roth. (247).

Spikelets very narrow, lanceolate, acuminate, in contracted much-divided panicles; rhachilla disarticulating above the glumes, not, or very shortly, continued beyond the floret. Floret 1, ♂, much shorter than the glumes. Glumes equal or subequal, very narrow, linear-lanceolate, acuminate, membranous keeled. lower 1-nerved, upper 3-nerved. Valve narrow, lanceolate in profile, membranous, glabrous, more or less shortly bifid,

5-3-nerved with a fine short dorsal, rarely subterminal, awn; callus small, long hairy, hairs usually much exceeding the valve. Pale 2-nerved, as long as the valve or somewhat shorter. Lodicules 2, hyaline. Anthers 3. Ovary glabrous. Styles distinct, short. Stigmas plumose, laterally exerted. Grain enclosed by the hardly changed valve and pale, free, subterete; hilum basal, small; embryo small.

Perennial, usually rather robust; blades long, linear, flat; ligules scarious; panicle more or less contracted, narrow rather dense, with much-divided branches, and short branchlets and pedicels; florets surrounded by long fine hairs.

C. epigeios, Rott., var. **capensis**, Stapf.

Lichtenburg, *Burt-Davy* 62A; Doornkloof, Irene, *Pole Evans* 336.

LIII. **HOLCUS**, Linn. (257).

Spikelets in rather dense, oblong, or interrupted panicles, laterally compressed, disarticulating from the tips of the pedicels; rhachilla slightly produced beyond the upper floret, disarticulating more or less readily below the valves; joints slender, lower curved and often appendaged. Florets 2; lower ♀, upper usually ♂, sometimes ♀ or barren. Glumes 2, membranous, keeled, acute or acuminate, lower 1-nerved, upper 3-nerved, sometimes awned. Valves shorter than the glumes, characteous, very obscurely 5-3-nerved, lower awnless, upper awned. Pales narrow, 2-keeled. Lodicules 2, delicate. Stamens 3. Ovary glabrous. Styles distinct. Stigmas plumose, laterally exerted. Grain laterally compressed, enclosed by the valve and pale and often adhering to the latter, soft; hilum short; embryo small.

Annual or perennial; blades flat or convolute when dry; panicle usually more or less contracted, sometimes almost spike-like; spikelets deciduous, pallid.

H. lanatus, L.

Pretoria, *Macdonald* in *Nat. Herb.* H. 5471; Broederstroom Orchards, Haenertsberg, Zoutpansberg, *Reineke* in *Nat. Herb.* H. 9763.

Yorkshire Fog—probably an escape from cultivation.

LIV. **AVENASTRUM**, Jess. (275).

Spikelets usually erect or sub-erect, rarely nodding, medium-sized (4-7 lin. long, rarely less or more), in nearly always erect, often stiff panicles; rhachilla more or less long-hairy, disarticulating above the glumes and between the valves, produced into a short bristle beyond the uppermost floret or ending with a rudimentary valve. Florets 3-6, ♀, or the uppermost more or less reduced. Glumes 2, persistent, scarious, more or less unequal, acute or acuminate, more or less distinctly keeled, lower 1-nerved or 3-nerved, upper 3- (very rarely 5- to sub-7-) nerved. Valves usually distinctly exerted from the glumes, more or less herbaceous, with scarious or hyaline tips, often rather firm, acute, or acuminate, bifid, with or without bristles from the lobes, 5-9-nerved, awned; awn dorsal from the middle or slightly above it, kneed and twisted below; callus short or elongate, villous. Pales shorter than the valves, 2-keeled, 2-toothed, or bifid. Lodicules 2, rather large, hyaline. Stamens 3. Ovary hairy from the middle upwards or at the top only. Styles distinct, short. Stigmas laterally exerted, plumose. Grain oblong, slightly laterally compressed, usually grooved in front, hairy at the top, pallid, rather soft, embraced by the somewhat hardened valve and the pale; hilum linear, up to half the length of the grain; embryo small.

Perennial, caespitose; blades linear, usually narrow, flat, or convolute; often setaceous ligules hyaline; panicle narrow, erect, often stiff, rarely flaccid or expanded.

A. turgidulum, Stapf.

Pretoria, *Stent* in *Nat. Herb.* H. 4363; Potchefstroom, *Burt-Davy* 5591; Vlakfontein, Wakkerstroom, *Burt-Davy* 4154.

LV. **TRISTACHYA**, Nees. (277).

Spikelets 5 lin. to 2 lin. long, lanceolate to linear, sessile or shortly pedicelled in clusters of three at the tips of the branches of a raceme or panicle; rhachilla disarticulating between the valves and less readily or imperfectly below them, glabrous, not produced beyond the upper floret. Florets 2, heteromorphous; lower ♂, upper ♀. Glumes persistent, membranous or sub-coriaceous, more or less unequal, 3-nerved, glabrous or bristly from black glands. Lower valve membranous, 3-nerved or 5-9-nerved, with some of the nerves much shorter than the others; upper valve convolute, membranous, or ultimately cartilaginous, bifid, 7- (rarely 5-) nerved, awned from between the lobes; awn kneed, twisted below. Pales membranous, hyaline, 2-keeled. Lodicules 2, cuneate, very fleshy. Stamens 3. Ovary obovoid to oblong, glabrous or the top hairy, rudimentary in the ♂ floret. Stigmas plumose, long, laterally exserted. Grain obovoid to linear-oblong, grooved, tightly embraced by the valve and pale, free; hilum linear, long; embryo large; albumen very hard.

Perennial; generally coarse grasses, growing mostly in compact tufts; leaves rigid; ligule a line of hairs; triplets of spikelets large and few in racemes, or smaller and more numerous in scantily branched panicles, sometimes deciduous from the jointed peduncles.

T. Rehmanni, Nees.

Eloff's Plantation, Pretoria, *Macdonald* in *Nat. Herb.* H. 5442; near Observatory, Johannesburg, *Burt-Davy* 4000 and 7491; Billy's Vlei, Ermelo, *Burt-Davy* 9222; Belfast, Lydenburg, *Burt-Davy* 1341; Bloemhof, *Theunissen* in *Nat. Herb.* H. 7871.

T. pallida, Stent, n. sp.

Gramen perenne. Culmi erecti ad 64 cm. alti, fasciculati e rhizomata abliquam, graciles, 2-nodi, glabri vel parte inferiore tenuiter hirsuta, nodis pubescentibus et saepe barbatis, innovationes intravaginales.

Folia plerumque a basem nata, culmos fere basim inflorescentiae condentia; *vaginae* glabrae, vel sparse hirsutae, base dense tomentosae, superiores; arctae argustaeque, inferiores latiores tandem solutae et patentes, tenuiter striatae, laevae, plerumque oribus longe hirsutae. *Laminae* angustae, arcte involutae, et saepe convolutae, glabrae vel albido-hirsutae, scaberulae, pallido glaucae, illae innovationum ad 34 cm. longae, 1.5 mm. latae; apice filiformi. *Panicula* contracta, ad 8 cm. longa, nodo infimo villosa; rami curvati, ascendentes, simplices, infimi verticillati, sequentes solitarii, vel raro birati; triade spicularum terminati. *Gluma inferior* lanceolata acuminata rigida, mucronata, 21 mm. longa, firmiter 3-nerva, nervi exteriores marginesque ordines duas setas e tuberculis nigris ferentes. *Gluma superior* glumam inferioram aequalis, sed tenuior, mutica, glabra firmiter 3-nervata, nervis scaberulis. *Anthoecium inferum* ♂; *valva* 15 mm. longa, lanceolata, acuminata, glabra, 7-nervis nervi scabri, interiores brevissimi, exteriores contigui; *palea* 8 mm. longa, biloba, lobi obtusis, minute ciliatis; carinis validis, minute ciliatis; *antherae* ad 4.5 mm. longae; *lodicae* cuneatae, .5 mm. longae, carosae. *Anthoecium superum* ♀; *valva* ovata lanceolata, biloba, 5-nerva, 7 mm. longa apice callo ad basim aristae, pubescente; lobi 2-3-nervis, 2 mm. longi, setis 5 mm. longis, arista 3.5 cm. longa, geniculata; callum acutum longe barbatum; *palea* angusta, obtuso-rotundata, vel subtruncata, carinae anguste alatae; *caryopsis* oblonga, apice hirsuta; *antherae* lodiculaeque eas in anthoecia inferes similis.

Pietersburg, *Capt. Goument* in *Nat. Herb.* H. 21318; Pyramid Estate, near Potgietersrust, upper slopes of granite mountains, *Galpin* 8893; Pretoria, *Schlechter* 3587.

Near to *T. biseriata*, Stapf (*ex descr.*), from which it differs in the 2-noded culms, the glabrous upper glume and lower valve, the 2-nerved lobes to the upper valve and the lack of a callous line at base of awn, and other minor points. I have not seen *Buchanan* 220, on which Stapf founded his *T. biseriata*, nor any other specimen that would correspond to his description of that species.

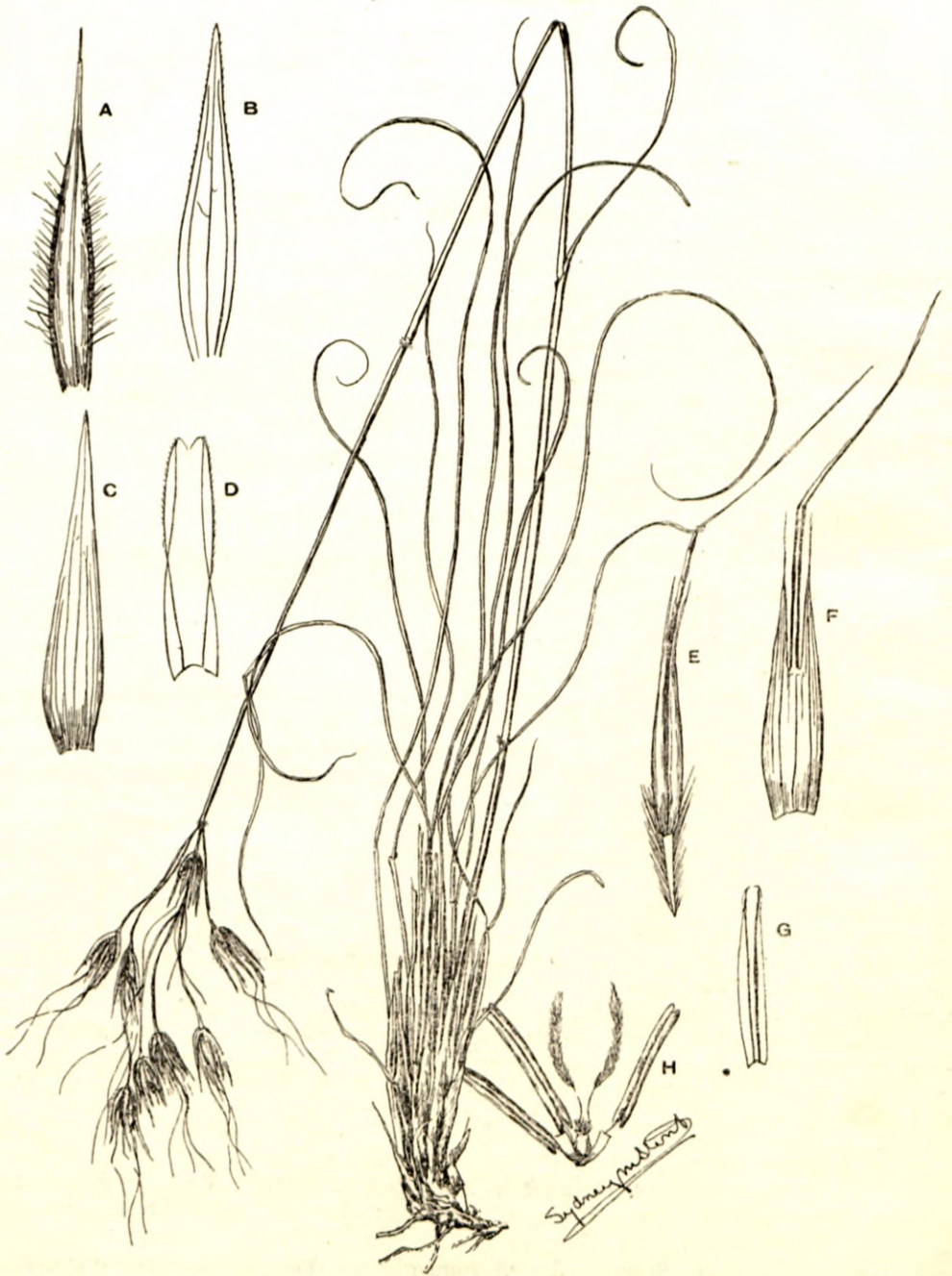


Plate IX.

Tristachya pallida, Stent.

A, Lower glume; B, Upper glume; C, Lower valve; D, Pale; E, Upper floret; F, Upper valve; G, Pale; H, Pistil, stamens, and lodicules.

T. leucothrix, Trin.

Meintjes Kop, Pretoria, *Burt-Davy* 3547; Barberton Mountains, *Burt-Davy* 338; Leeuwpoort, Carolina, *Burt-Davy* 7448; Belfast, Lydenburg, *Burt-Davy* 1324; Heidelberg, *Burt-Davy* 3146; Blesbokspruit, Ermelo, *Burt-Davy* 949; Vlakfontein, Wakkerstroom, *Burt-Davy* 9052; Athol, Wakkerstroom, *Macdonald* in *Nat. Herb.* H. 104.

T. pedicellata, Stent (in *Bothalia*, I, iii).

Mosdene, Naboomspruit, *Galpin* M. 428; Warmbaths, *Baylis* in *Nat. Herb.* 4350; *Burt-Davy* 1154.

LVI. **TRICHOPTERYX**, Nees. (278).

Spikelets usually 2-18 lin. long, more or less lanceolate to linear, pedicelled, paniced; rhachilla disarticulating between (and less readily below) the valves, glabrous, not produced beyond the upper floret. Florets 2, heteromorphous; lower ♂, rarely barren; upper ♀. Glumes persistent, membranous or subcoriaceous, unequal, 3- (very rarely 4-6-) nerved, glabrous or bristly from black glands. Lower valve membranous 3- (very rarely 7-) nerved, with the innermost side nerves much shorter; upper valve terete, membranous to cartilaginous, shortly bifid with the lobes sometimes produced into bristles, 5-9-nerved; awn from between the lobes, kneed, twisted below. Pales membranous, 2-keeled, narrower in the ♀ floret and channelled between the stout keels. Lodicules 2, cuneate, usually very fleshy. Stamens 2, rarely 3, or 0 in the lower floret. Ovary oblong, glabrous, rudimentary in the ♂ floret. Styles distinct, glabrous. Stigmas plumose, long, laterally exerted. Grain obovoid to linear-oblong, grooved or almost terete, tightly embraced by its valve and pale, free; hilum linear, long; embryo large; albumen very hard.

Perennial, rarely annual grasses of very different habit; leaves more or less rigid; ligules a line of hairs; spikelets slender, from 2 lin. to 1½ lin. long, scattered in mostly contracted, narrow panicles.

T. simplex, Hack.

The Willows, Pretoria, *Burt-Davy* 7486; Johannesburg, *Burt-Davy* 7492, *Bryant* C. 38; Waterval Boven, *Burt-Davy* 1426.

Var. **crinita**, Stapf.

Ermelo, *Burt-Davy* 5503; Spionkop, *Burt-Davy* 9230; Belfast, Lydenburg, *Burt-Davy* 1342.

Var. **sericea**, Stapf.

Waterval Boven, Carolina, *Burt-Davy* 1439, *Burt-Davy* 2983; Machadadorp, *Mundy* in *Nat. Herb.* H. 4286; Billy's Vlei, Ermelo, *Burt-Davy* 9201.

T. flavida, Stapf.

Pretoria, *Macdonald* in *Nat. Herb.* H. 5429, 5407, 5413, 54531; *Schlechter* 3606; Johannesburg, Observatory Ridge, *Burt-Davy* 3093.

T. sp. A.

Waterval Boven, Carolina, *Burt-Davy* 1426, 1408; downs, Zoutpansberg, *Junod* 4082.

A tropical species with quite glabrous spikelets, broadly truncate lower glume—a rather short, delicate, and obscurely nerved fertile valve.

"Very much spread over the veld; bad food for cattle."—*Junod*.

LVII. **MICROCHLOA**, R. Br. (281).

Spikelets 1-2-flowered, small, sessile, crowded, unilateral on a flattened rhachis, alternately 2-seriate from near the margins of the rhachis or in a single row; rhachilla disarticulating above the glumes, more or less produced. Floret hermaphrodite, or if 2, the lower hermaphrodite, the upper male or indicated by an empty valve. Glumes 2, persistent or (particularly the upper) deciduous, strongly 1-nerved, flattened from the

back or keeled, subequal. Valve shorter than the glumes, delicate, white, minutely or obscurely mucronulate or emarginate, 3-nerved, densely hairy along the nerves (if 2, the upper glabrous); callus small, acute, hairy. Pale slightly shorter than the valve or almost equal, 2-keeled. Lodicules 2, cuneate, glabrous, thin, faintly nerved. Stamens 3. Ovary glabrous (quite suppressed in the upper floret). Styles distinct. Stigmas plumose, laterally exerted. Grain oblong, terete, triquetrous, or compressed, embraced by the uncharged valve and pale, free; hilum punctiform; embryo equalling quarter to half the length of the grain.

Perennial, rarely annual, sometimes densely tufted; leaves narrow, often sub-setaceous; ligules reduced to a minutely ciliolate rim; spikes solitary, terminal (in the African species) or 2-4 in a terminal umbel, straight or curved.

M. setacea, R. Br.

Pretoria, *Macdonald* in *Nat. Herb.* H. 5476; Houtbosch, *Schlechter* 4697; Sabie Falls, Lydenburg, *Burt-Davy* 1550A; Belfast, Lydenburg, *Burt-Davy* 1287A; Potchefstroom, *Burt-Davy* 1225; Christiana, Bloemhof District, *Burt-Davy* 11392, 14099, 14133, 12781.

M. caffra, Nees.

The Willows, Pretoria, *Burt-Davy* 4483; Irene, near Pretoria, *Burt-Davy* 3859; near Robinsons, Carolina District, *Burt-Davy* 2720; Leeuwpoot, Carolina, *Burt-Davy* 7377; Athol, Ermelo, *Macdonald* in *Nat. Herb.* H. 94.

This species differs from the preceding (*ex descr.* by Stapf in *Dyer, Flor. Cap.*) in the size of the spikelets and in the shape of the valve, and on these characters I have temporarily based my identifications. I have not seen R. Brown's original description of *M. setacea*, nor have I seen the type-material of either species. The differences between the two grasses are so slight that it may seem advisable, when I have had an opportunity of examining the types, to place them all under one species.

M. altera, Stapf, var. Nelsonii, Stapf.

Spionkop, Ermelo District, *Burt-Davy* 9243.

LVIII. CYNODON, Pers. (282).

Spikelets 1-flowered, small, laterally compressed, sessile imbricate, alternately 2-seriate and unilateral on a slender keeled rhachis; rhachilla disarticulating above the glumes, produced, or not, beyond the valve. Floret hermaphrodite. Glumes narrow, keeled, acute or subulate-mucronate, the upper usually deciduous with the valve, the lower sub-persistent. Valve exceeding the glumes, navicular, firmly membranous, 3-nerved, awnless, keel ciliate. Pale somewhat shorter than the valve, 2-keeled. Lodicules 2, minute, obovate-cuneate, glabrous. Stamens 3. Ovary glabrous. Styles distinct, slightly shorter than the plumose styles. Grain oblong, subterete; embryo about third the length of the grain; hilum linear, two-thirds the length of the grain.

Perennial; stems creeping, rooting at the nodes and emitting from them fascicles of barren shoots and flowering culms; spikes 2-6 in terminal umbels.

C. dactylon, Pers.

Pretoria, *Mogg* in *Nat. Herb.* H. 16950; Germiston, Johannesburg, *Fenn* in *Nat. Herb.* H. 8746; Komatipoort, Barberton, *Burt-Davy* 368; Nylstroom, Waterberg, *Burt-Davy* 2086; bushveld, Pretoria, *S. Reck* in *Nat. Herb.* H. 3533; downs, open veld, Zoutpansberg, *Junod* 4101; Pilgrims Rest, Lydenburg, *Legat* in *Nat. Herb.* H. 1585; Lichtenburg, *Burt-Davy* 58; Schweizer Reneke, Bloemhof, *Burt-Davy* 1634; Christiana, Bloemhof, *Burt-Davy* 14094, etc.

"Bermuda quick." "Regte kweek," a cosmopolitan weed.

C. incompletus, Nees.

Helvetia, near Machadodorp, Lydenburg, *Burtt-Davy* 7245; New Agatha, Zoutpansberg, *Burtt-Davy* 1214; Spionkop, Ermelo, *Burtt-Davy* 9262; near Morgenzon, Ermelo, *Burtt-Davy* 1011; Carolina, *Burtt-Davy* 2713; banks of the Vaal River, Bloemhof, *Burtt-Davy* 1516; Vierfontein, Schweizer Reneke, Bloemhof, *Burtt-Davy* 1635.

Indigenous to South Africa. An excellent lawn grass.

C. transvaalensis, *Burtt-Davy* (in "Kew Bulletin," 1921, 283)

Burger's Park, Pretoria, *Stent* in *Nat. Herb.* 10798, 10799; Houghton Estate, Johannesburg, *Bryant* C. 10; Uitval, Vereeniging, *Turner* in *Nat. Herb.* 21224; Lake Chrissie, Ermelo, *Burtt-Davy* 9270.

There is no doubt that all the above specimens belong to the grass described by Mr. *Burtt-Davy* as *Cynodon transvaalensis*, but at least two of the characters on which he relies to separate it from *C. dactylon* are not constant. The distachyous inflorescence, while being certainly the most common form of inflorescence, is often replaced by a tri- and occasionally quadri-stachyous inflorescence, and the valves vary from eciliate to pronouncedly, though usually appressedly, ciliate. The delicate fine habit of the grass, with its slender stolons and culms and soft, narrow, and rather short leaves, renders it quite distinct from even fine-leaved forms of *C. dactylon*. It is one of the best grasses of the country for bowling greens, etc., making a smooth, compact, and beautifully green turf. To horticulturists it is usually known as Germiston or Florida grass.

LIX. HARPECHLOA, Kunth. (285).

Spikelets of 3-4 florets, sessile, crowded, unilateral, alternately biseriate along the midrib of a flattened rhachis; rhachilla disarticulating above the glumes, continuous between the valves, the lower floret hermaphrodite, the following 1 or 2 male, the uppermost barren, rudimentary. Glumes unequal, the lower persistent, keeled, very thin, 1-nerved, the upper much longer, oblong, flattened on the back, 2-3-nerved, firm. Hermaphrodite floret about equalling the upper glume. Valve folded, obliquely oblong in profile, obtuse, white, thin, 3-nerved, densely ciliate along the nerves; callus obscure. Pale slightly shorter, 2-keeled. Lodicules cuneate, fleshy, almost 2-winged. Stamens 3. Ovary glabrous. Styles distinct. Stigmas slender, plumose, laterally exserted. Upper florets crowded in a club-shaped body, not exceeding the hermaphrodite floret, enveloped by the valve of the lower male floret; valves 2-nerved or with a trace of the middle nerve near the apex, ciliolate or glabrous; pales 2-nerved; stamens 3 or 0; ovary usually quite suppressed. Grain free, embraced by the unchanged valve and pale, oblong, obtusely triquetrous; embryo half the length of the grain; hilum punctiform, basal.

Perennial, densely caespitose; leaves firm, folded or convolute above, more or less curved; spikes terminal, solitary, rarely geminate, dark olive-grey.

H. capensis, Kunth.

Houghton Estate, Johannesburg, *Bryant* C. 12; Barberton Mountains, *Burtt-Davy* 339; Zoutpansberg, *Worsdall* in *Nat. Herb.* H. 5919; Volksrust, Wakkerstroom, *Burtt-Davy* 5350; Ermelo, *Burtt-Davy* 3909, 948; Amersfoort, Wakkerstroom, *Burtt-Davy* 9051.

LX. CTENIUM, Panz. (286).

Spikelets of 3-4 florets, sessile, compactly crowded, unilateral, alternately biseriate along the midrib of the flattened rhachis; rhachilla disarticulating above the glumes, continuous between the valves, the lower two florets barren or the second male, the third hermaphrodite, the fourth male or barren, or quite rudimentary. Glumes unequal, the lower persistent, keeled, thin, 1-nerved, the upper much longer, oblong to lanceolate, flattened or rounded on the back, firm, 2-3-nerved, with a stiff awn from the middle. Valves oblong in profile, obtuse, 3-nerved, awned just below the tips, ciliate along the

nerves or the uppermost glabrous, white, thin. Pales slightly shorter, 2-keeled or 2-nerved. Lodicules 2, quadrate-cuneate, delicate, faintly nerved. Stamens, three in the hermaphrodite, two in the male florets. Ovary glabrous. Styles distinct. Stigmas slender, long, laterally exserted. Grain free, embraced by the unchanged valve and pale, oblong; embryo up to half the length of the grain; hilum basal, punctiform.

Perennial, densely tufted, rarely annual; leaves narrow, flat, or convolute; spikes terminal, solitary or in umbels of 2-3, usually curved; spikelets prettily pectinate and awned.

C. concinnum, Nees.

Pretoria, *Macdonald* in *Nat. Herb.* H. 5480; Billy's Vlei, Ermelo, *Burt-Davy* 9218, 9226; Ermelo, *Burt-Davy* 9369, 613; Lake Chrissie, Ermelo, *Hamilton* in *Nat. Herb.* H. 4332; Leeuwpoot, Carolina, *Burt-Davy* 7331, 2959; Pan-plaats, Pan Station, Middelburg, *Burt-Davy* 13320, 13289; Belfast, Lydenburg, *Burt-Davy* 1340.

LXI. **CHLORIS**, Swartz. (288).

Spikelets of 2-4 florets, sessile, crowded, unilateral, 2-seriate on a slender rhachis; rhachilla disarticulating above the glumes, tough between the valves, more or less produced; lowest floret hermaphrodite, the second male or barren, the following, if present, barren, often minute. Glumes 2, persistent, narrow, keeled, acute and mucronate, very thin, or broad, and the upper obtuse, more or less bilobed and rounded on the back. Hermaphrodite floret; valve narrow or broad, 3-nerved, acute or obtuse, minutely 2-toothed, usually awned from below the apex, often ciliate; pale almost equalling the valve, 2-keeled; lodicules 2, minute, delicate, glabrous; stamens 3; ovary glabrous, styles distinct, short; stigmas laterally exserted. Male floret: valve and pale as in the hermaphrodite flower, but smaller and glabrous; rudimentary florets glabrous, awned or awnless, small to very small, usually without a trace of a pale; grain oblong, triquetrous; embryo rather large; hilum punctiform, basal.

Perennial or annual; leaves flat or folded; spikes solitary or several to many in terminal umbels or short racemes; erect or stellately spreading.

C. pycnothrix, Trin.

Arcadia, Pretoria, *Burt-Davy* 8054; *Mogg* in *Nat. Herb.* H. 10086.

C. virgata, Schw.

Irene, near Pretoria, *Burt-Davy* 581; Mosdene, Naboomspruit, Waterberg, in black turf, *Galpin* M. 430; Springbox Flats, Waterberg, *Saunders* in *Nat. Herb.* H. 2138; Shilovane, Zoutpansberg, *Junod* in *Nat. Herb.* H. 4681; Standerton, *Burt-Davy* 907; Schweizer Reneke, Bloemhof, *Burt-Davy* 1650; Christiana, Bloemhof, *Burt-Davy* 12797.

"Old lands grass." "Sweet grass," a useful hay-grass, known in the Orange Free State as Kwas gras.

C. gayana, Kunth.

Skinners Court, Pretoria, *Stent* in *Nat. Herb.* H. 5084; Tzaneen, Zoutpansberg, *Sampson* in *Nat. Herb.* H. 4454, 4451; Experiment Station, Potchefstroom, *Burt-Davy* 2704.

"Rhodes grass." One of our best indigenous hay and pasture grasses, both frost and drought resistant—very palatable.

C. petraea, Thunb.

Meintjes Kop, Pretoria, *Burt-Davy* 5381; Skinners Court, Pretoria, *Baylis* in *Nat. Herb.* H. 5376; De Kroon, Brits, Rustenburg, *Stent* in *Nat. Herb.* H. 6115; Mosdene, Naboomspruit, Waterberg, *Galpin* M. 431; Warmbaths, Waterberg, *Burt-Davy* 2345; downs, Zoutpansberg, *Junod* 4085; Potchefstroom, *Burt-Davy* 1067; Smitskraal, Bloemhof, *Burt-Davy* 10098.

LXII. **TRIOGON**, Rott. (298).

Spikelets many flowered; flowers, perfect or the uppermost reduced, biseriate and unilateral on a slender terminal spike, disarticulating above the glumes. Glumes 1-nerved dissimilar, lower usually inequilateral, one margin being deeply notched or dilated suddenly below the middle into a lobe or wiry or segment; upper entire or notched below the mucronate or apiculate tip. Valves ovate dorsally convex, 2-fid, and awned in the cleft, or 4-fid, with the outer lobes awned and the inner membranous and rarely awned. Palea broad or narrow, complicate. Stamens 3. Styles very short. Grain very narrow, free.

Slender, densely tufted grasses; leaves usually convolute; ligule delicately hyaline and fimbriate.

T. abyssinicus, Nees (*ex* Steud. Syn. Gram., 301).

Onderstepoort, *Mogg* in *Nat. Herb.* H. 18252; Komatipoort, Barberton, *Schlechter* 11841.

LXIII. **DINEBRA**, Jacq. (302).

Spikelets 2-3-flowered, small, crowded, biseriate unilateral on slender, spreading, or deflexed spikes that are collected in narrow, pyramidal racemes, disarticulating above the glumes. Glumes slightly unequal, persistent, lanceolate, 1-nerved, keeled and awned, much exceeding the valves. Valves very small, broadly ovate, subacute, hyaline 1-nerved. Palea hyaline. Anthers 3, small. Styles free. Grain ovoid, trigonous, wrinkled, free.

An annual, leafy grass; leaves flat. Ligules membranous.

D. arabica, Jacq. (Fragment, 77, t. 121).

Pienaars River, Pretoria District, in swamplands, *Osborne* in *Nat. Herb.*; Onderstepoort, *Pole Evans* 437; Crocodile River, Rustenburg, *Burt-Davy* 9293; Mosdene Naboomspruit, Waterberg, *Galpin* M. 526.

LXIV. **ELEUSINE**, Gaertn. (304).

Spikelets 3-6-flowered, laterally compressed, densely imbricate, alternately biseriate unilateral, sessile on a flattened rhachis, the uppermost terminal, perfect rhachilla disarticulating above the glumes and between the valves, or tough, produced, sometimes terminating with a rudimentary valve. Florets ♀. Glumes 2, subequal, persistent, obtuse or obscurely mucronate, membranous, strongly keeled, 3-5-nerved, the lateral nerves close to the keel, the lower shorter, with the keel crested. Valves very similar, 3-nerved near the base; lateral nerves submarginal above, with 1-2 short additional nerves close to the keel. Pales slightly shorter than the valves, 2-keeled, keels winged. Lodicules 2, minute, cuneate. Stamens 3. Ovary glabrous. Styles slender from a broadened base, distinct. stigmas plumose, laterally exerted. Grain broadly oblong to globose, broadly grooved; pericarp loose, delicate, breaking up irregularly or almost circumscissile; seed finely striate; embryo suborbicular, basal; hilum punctiform, basal.

E. indica, Gaertn.

Koster River, Rustenburg, *Burt-Davy* 146; Haenertsberg, Zoutpansberg, *Legat* in *Nat. Herb.* H. 140; Tzaneen, Zoutpansberg, *Sampson* in *Nat. Herb.* H. 4432; Waterval Boven, Carolina, *Burt-Davy* 1432; Belfast, Lydenburg, *Burt-Davy* 1264; Lake Chrissie, Ermelo, *Hamilton* in *Nat. Herb.* H. 5910.

"Goose grass." A common annual weed throughout the Transvaal.

E. coracana, Gaertn.

Devon, Bethal, *Moodie* in *Nat. Herb.* H. 3429.

A species cultivated as a forage grass and also as a cereal, from which the natives brew a kind of beer; known to the natives as M'Poko.

LXV. **DACTYLOCTENIUM**, Willd. (305).

Spikelets 3-5-flowered, laterally compressed, densely imbricate, biseriate, sessile, unilateral on a flattened rhachis, the uppermost reduced; rhachilla tardily disarticulating above the glumes, tough between the valves. Florets ♀, the uppermost rudimentary. Glumes 2, unequal, strongly keeled, the lower ovate, acute, thin, persistent, the upper elliptic-oblong in profile, obtuse, mucronate or awned, firm, deciduous. Valves ovate, subacuminate, 3-nerved, mucronate or awned, deciduous with the grains. Pales about as long as the valves, 2-keeled, subsistent. Lodicules 2, cuneate, minute. Stamens 3. Ovary glabrous. Styles distinct, very long, subterminally exserted. Grain subglobose, slightly laterally compressed, not grooved or hollowed, rugose or punctate; pericarp very delicate, irregularly breaking away; embryo scarcely equalling half the length of the grain; hilum basal, punctiform.

Annual or perennial; leaves flat, subflaccid; spikes in umbels of 2-6, erect or stellately spreading; tips of the rhachis barren, mucroniform, usually curved.

D. aegyptiacum, Willd.

Pretoria, *Reck* in *Nat. Herb.* H. 3968; *Burt-Davy* 39; Warmbaths, Waterberg, *Burt-Davy* 1758; Mosdene, Naboomspruit, *Galpin* M. 432.

"Crowfoot grass," occasionally cultivated as a hay crop.

LXVI. **LOPHACME**, Stapf (309A).

Spikelets laterally compressed, subsessile, somewhat distant on the long, slender, simple subdigitate branches of a panicle; rhachilla slender, glabrous, disarticulating above the glumes and between the two lowest valves, tough above. Florets, about 6, the lowest 2 ♂, shorter than the contiguous glumes, the following gradually reduced, barren, embracing each other and forming a tuft of awns. Glumes unequal, narrow, membranous, 1-nerved, keeled, persistent. Fertile valves linear-lanceolate in profile, 2-toothed, membranous, 3-nerved, with the side nerves evanescent above, finely awned from between the teeth; callus minutely hairy; barren valves entire, glabrous, passing into fine awns, without a callus. Pales very narrow, 2-keeled, slightly shorter than the valves. Lodicules 2, very minute, cuneate, hyaline. Stamens 3. Ovary glabrous. Styles distinct, short. Stigmas loosely plumose, laterally exserted. Grain unknown.

Perennial (?); blades flat; ligule a ciliate rim; panicle subdigitate, of very slender somewhat flexuous spike-like racemes.

L. digitata, Stapf.

Pretoria, *Macdonald* in *Nat. Herb.* H. 5468; Johannesburg, *Bryant* D. 11; Ermelo, *Burt-Davy* 5468; Lake Chrissie, Ermelo, *Hamilton* in *Nat. Herb.* H. 997, H. 10644.

LXVII. **CROSSOTROPIS**, Stapf (309B).

Spikelets laterally compressed, subsessile, more or less distinctly 2-ranked on the rigid simple branches of a panicle; rhachilla slender, disarticulating above the glumes and between the valves. Florets 3-9, ♀, or the uppermost more or less reduced, equalling the glumes or slightly exserted, or over-topped by the awn-like tips of the glumes. Glumes subequal or equal, narrow, membranous, strongly 1-nerved, keeled, persistent. Valves somewhat distant, linear-oblong in profile, shortly 2-lobed, mucronate or shortly awned from the sinus, membranous, 3-nerved, side nerves submarginal, subpercurrent, rigidly ciliate, margins inflexed; callus small, hairy. Pales narrow, 2-keeled, slightly shorter than the valves. Lodicules 2, cuneate, small. Stamens 3. Ovary glabrous. Styles distinct, very slender. Stigmas plumose, laterally exserted. Grain oblong, strongly compressed from the back, concave or flat, enclosed by the slightly altered valve and pale; embryo about half the length of the grain; hilum basal, punctiform.

Annual or perennial; blades usually flat; ligules hyaline; panicle contracted and narrow, or open with the branches spreading at right angles; spikelets rather close to very distant, the uppermost terminal.

C. grandiglumis, Rendl.

The Willows, Pretoria, *Stent* in *Nat. Herb.* H. 9952; Mosdene, Naboomspruit, Waterberg, *Galpin* M. 434; Lydenburg *Schlechter* 3948; Natalspruit, *Wentworth* *Sykes* in *Nat. Herb.* H. 8887; Christiana, Bloemhof, *Burt-Davy* 14093, 13041.

LXVIII. **ENNEAPOGON**, Desv. (310).

Spikelets 3-flowered, paniculate; rachilla disarticulating above the glumes, minutely scaberulous or almost smooth. Lowest floret ♂, the intermediate male or barren, the uppermost rudimentary, minute. Glumes 2, persistent, membranous, acute or obtuse or minutely truncate, 3-5- or sub-7-nerved. Hermaphrodite floret; valve very broad, rounded on the back, rather firm, more or less villous, 9-nerved, 9-awned; awns subulate, equal or subequal, plumose, ciliate or scaberulous; callus minute, short. Pale oblong, 2-keeled, exceeding the valve. Lodicules 2, minute, cuneate, fleshy. Stamens 3. Ovary glabrous. Styles distinct, short. Stigmas laterally exerted, loosely plumose. Second floret like the lower, but the valve about half as long, glabrous, the ovary rudimentary or suppressed. Uppermost floret reduced to a tuft of minute awns. Grain oblong, dorsally more or less compressed; hilum punctiform, subbasal; embryo large, occupying three-quarters, or more, of the front.

Perennial, rarely subannual; blades usually narrow, often convolute; ligules reduced to a line of hairs; panicle contracted, more or less spike-like, elegantly bristly plumose from the numerous awns.

E. pretoriensis, *Stent* (*Bothalia*, I, 174).

Wonderboom, Pretoria, *Burt-Davy* 8905; northern slopes of Magaliesberg, Pretoria, *Fouche* 1.

E. scoparius, Stapf.

Bushveld, Pretoria, *Reck* in *Nat. Herb.* H. 186; Bloemhof District, Proposal, *Burt-Davy* 9473; Smitskraal, *Burt-Davy* 12915; Christiana, *Burt-Davy* 14128; Schweizer Reneke, *Burt-Davy* 1681.

LXIX. **SCHMIDTIA**, Steud. (312).

Spikelets closely 4-6-flowered; rachilla disarticulating above the glumes and between the valves, joints extremely short, glabrous. Florets hermaphrodite, except the rudimentary uppermost one. Glumes 2, persistent, membranous, acute or subobtuse, 9-11-nerved. Valves broad, rounded on the back, rather firm and villous below, 9-nerved, five of the nerves excurrent into straight subulate scabrid awns, the four alternate ones into very thin lanceolate mucicous lobes; callus slender, minute, bearded. Pales oblong, 2-keeled, rather longer than the body of the valves. Lodicules 2, minute, cuneate, fleshy. Stamens 3. Ovary glabrous. Styles distinct, slender. Stigmas laterally exerted; loosely plumose. Grain oblong, dorsally compressed; hilum punctiform, subbasal; embryo large, occupying three-quarters or more of the back of the grain.

Perennial or annual (?); more or less glandular-pubescent; blades rather rigid, flat, or convolute; ligule a line of hairs; panicle contracted, narrow, oblong, or spike-like; spikelets turgid, many-bristled.

S. bulbosa, Stapf.

Zandbult, near Warmbaths, Waterberg, *Bateman* in *Nat. Herb.* H. 10304; Mosdene, Naboomspruit, Waterberg, *Galpin* M. 448; Christiana, Bloemhof, *Burt-Davy* 14098; Schweizer Reneke, *MacLaitchie* in *Nat. Herb.* H. 8963; Kaffraria, Bloemhof District, *Burt-Davy* 12945.

Bateman's specimens from Zandbult represents a form with very short awns.

This is known as "Sand quick," and is a useful pasture grass of the dry sandy regions of the Western Transvaal and Bechuanaland.

LXX. **TRIRAPHIS**, R. Br. (317).

Spikelets 5-15-flowered, laterally compressed, pedicelled, paniced; rhachilla disarticulating above the glumes and between the valves. Florets ♂, the uppermost gradually reduced. Glumes subequal, lanceolate to linear-lanceolate, acuminate or truncate, or minutely 2-toothed and aristulate, 1-nerved, keeled, thin. Valves oblong, 3-lobed, thin, 3-nerved, 3-awned, the middle lobe more or less bifid, awned from the sinus, the side lobes shorter, entire, asymmetric, awned from the inner side, margins inflexed, nerves ciliate, particularly the lateral; awns fine, scabrid, often longer than the valves; callus slender, acute, bearded. Pales linear or linear-oblong, somewhat shorter than the valves. Lodicules 2, cuneate, delicate, minute. Stamens 3. Ovary glabrous. Styles distinct, slender. Stigmas laterally exserted, very slender, plumose. Grain tightly embraced by the scarcely changed valve and pale, linear, terete, or obtusely triquetrous; embryo short; hilum basal, punctiform.

Annual or perennial; blades narrow, linear; ligule a ciliate membranous rim; panicle contracted, spike-like, or open, much-branched; spikelets distinctly pedicelled.

T. Rehmanni, Hack.

Mosdene, Naboomspruit, Waterberg, *Galpin* M. 438; Henley-on-Klip, Heidelberg, *Stent* in *Nat. Herb.* H. 21141; Welverdiend, Potchefstroom, *Burt-Davy* 14581; Bloemhof District, Christiana, *Burt-Davy* 1297, 13130; Schweizer Reneke, *Burt-Davy* 1683.

T. Schlechteri, Pilg.

Mosdene, Naboomspruit, Waterberg, *Galpin* M. 439.

Perennial; about 120 cm. high, culms simple, 5-noded internodes included or shortly exserted, except the uppermost, which is very long and long exserted. Sheaths terete, tight, and finely striate, the lower splitting into rigid fibres; ligule long ciliate; blades up to about 50 cm. long and 6-7 mm. wide, long, tapering to a fine setaceous point, primary lateral nerves about five on each side of and scarcely differing from the midrib, glabrous and smooth all over or slightly scaberulous beneath. Panicle about 37 cm. long, contracted; branches in fascicles, longest about 1.5 cm., branchlets and spikelets appressed; spikelets about 14 mm. long, including the awns—glumes reddish, bifid, mucronate lanceolate, scabrid, 1-nerved, lower 5 mm., upper 6 mm. long. Valves linear-lanceolate, 5 mm. long, middle awn about 5 mm. long; scabrid slightly longer than the scabrid side awns.

This agrees with *Schlechter* 11664, from Lourenco Marques in the Kew Herbarium, and which was distributed under Pilger's name *T. Schlechteri*. I can, however, find no reference in any literature to this species, and it appears that no description has been published.

LXXI. **FINGERHUTHIA**, Nees. (326).

Spikelets strongly laterally compressed, in compact spike-like panicles, jointed on and deciduous from the pedicels; rhachilla tough. Florets 1, ♀, or if more, then the uppermost ♂ or rudimentary. Glumes 2, subequal, narrow, thin, complicate, 1-nerved, keeled, shortly awned or mucronate. Valves oblong to lanceolate, mucronate, rather firm, 7-5- (rarely 3-) nerved, the upper smaller. Pales slightly shorter than the valves, ovate-oblong, 2-keeled, flaps broad. Lodicules 2, cuneate. Stamens 3. Ovary glabrous, slightly constricted below the apex (at least, after fecundation). Styles distinct, rather long. Stigmas very slender, finely plumose, subterminally exserted. Grain unknown.

Perennial, caespitose; innovation shoots intravaginal; blades narrowly linear; ligule a dense line of silky hairs; panicle compact, spike-like; the lowest spikelets barren, consisting of a few empty glumes.

F. africana, Lehm.

Skidders Court, Pretoria, *Stent* in *Nat. Herb.* H. 5168 ; Springkok Flats, Waterberg, *Sampson* in *Nat. Herb.* H. 4452, *Burt-Davy* 1129 ; Christiana, Bloemhof, *Burt-Davy* 13078, 13099, 14123, 1497.

LXXIIA. ARUNDO, Linn. (331).

Spikelets 2-7-flowered, laterally compressed, in very compound panicles, rhachilla disarticulating above the glumes and between the valves, joints short, glabrous ; florets hermaphrodite, the uppermost reduced. Glumes equal, broadly lanceolate, shortly acuminate, keeled, membranous, 3-5-nerved. Valves more or less equalling the glumes, ovate to lanceolate-ovate, acuminate, finely bifid or entire, long hairy below, 5-9-nerved, three nerves more or less percurrent or excurrent, the rest short, the middle nerve often produced into a short, fine bristle ; callus short, shortly bearded. Pales slightly exceeding half the length of the valve, 2-keeled. Lodicules 2, obovate, nerved, glabrous. Stamens 3. Ovary glabrous. Styles distinct, almost as long as the laterally exerted plumose stigmas. Grain obovoid-oblong, broad, loosely enclosed by the valve and pale ; hilum basal, punctiform ; embryo occupying almost wholly one side of the grain.

Perennial, with creeping rhizomes, extravaginal shoots and very tall and stout culms ; leaves rather evenly distributed over the culms ; sheaths slightly exceeding the internodes ; blades long, broad, flat ; ligules very short, membranous ; panicles large, much compound ; spikelets hairy.

A. donax, Linn.

Although this grass is not represented in the National Herbarium, it is known to occur fairly plentifully on river banks in the subtropical parts of the Transvaal.

LXXII. PHRAGMITES, Trin. (333).

Spikelets loosely 3-10-flowered, awnless, in large panicles ; rhachilla disarticulating above the first and between the following valves, slender, glabrous, joints very short ; lowest flower male or abortive, the following hermaphrodite, the uppermost florets reduced. Glumes thin, unequal to subequal, lanceolate, acute, more or less rounded on the back, 3-nerved, or the lowest sometimes sub-5-nerved. Valves heteromorphous, the lowest linear-lanceolate, much longer than the subtending glume, otherwise of a similar structure, quite glabrous, persistent, the following valves very thin, linear, long and more or less caudate-acuminate, 3-nerved, middle nerve percurrent, side nerves fine, short, callus long, slender, with very long silky hairs. Pales linear-oblong, about half as long as the valves, 2-keeled. Lodicules 2 (or sometimes 3 in the lowest floret), obovate, 2-3-nerved, glabrous, Stamens 3, or 2 in the lowest floret. Ovary glabrous, in the lowest flower rudimentary or quite suppressed. Styles distinct, rather short. Stigmas laterally exerted, densely plumose. Grain loosely enclosed by the valve and pale, free, oblong, semiterete ; hilum oblong, short basal ; embryo about half as long as the grain.

Perennials with a creeping rhizome ; extravaginal innovation shoots, and tall sheathed annual or perennial culms ; blades flat ; ligule a narrow, ciliate, membranous rim ; panicle lax, usually very large and much compound ; spikelets conspicuously silky from the long callus hairs.

P. communis, Trin.

Skidders Court, Pretoria, *Burt-Davy* in *Nat. Herb.* H. 610 ; Selous River, Rustenburg, *Burt-Davy* 158 ; Komatipoort, Barberton, *Burt-Davy* 358 ; Lichtenburg, *Burt-Davy* 62 ; Zeerust, Marico, *Burt-Davy* 120 ; Vlaktefontein, near Amersfoort, Wakkerstroom, *Burt-Davy* 4039.

LXXIII. POGONARTHRIA, Stapf (337A).

Spikelets laterally compressed, subsessile, more or less imbricate, secund on the irregularly spirally arranged branches of a panicle ; rhachilla disarticulating above the glumes and between the valves, tips of the joints ciliate. Florets 2-8, ♀. Glumes rigidly

membranous, 1-nerved. Valves oblong, rigidly membranous, acuminate, quite glabrous, 3-nerved; side nerves evanescent above the middle. Pales 2-keeled, slightly shorter than the valves. Lodicules 2, minute, delicate. Stamens 3. Ovary glabrous. Styles distinct. Stigmas plumose. Grain tightly embraced by the scarcely altered valve and pale, linear-oblong, obtusely triquetrous or oval in cross-section; embryo less than half the length of the grain; hilum basal, punctiform.

Perennial, stiff; blades rigid, usually convolute; ligule a fringe of cilia; panicles straight, with spreading, more or less curved, branches in irregular spirals; spikelets secund, crowded, livid, purplish or dark grey.

P. falcata, Rendl.

The Pyramids, Pretoria, *Burt-Davy* 4478; Henley-on-Klip, Heidelberg, *Stent* in *Nat. Herb.* H. 21145; Barberton, *Burt-Davy* 8011; Pruizen, Pietpotgietersrust, Waterberg, *Burt-Davy* 2220; Mosdene, Naboomspruit, Waterberg, *Galpin* M. 449; Springbok Flats, Waterberg, *Burt-Davy* 1110; Warmbaths, *Burt-Davy* 2403; Slurry, Marico, *O'Connor* in *Nat. Herb.* H. 18962; Shilavane, Zoutpansberg, *Junod* in *Nat. Herb.* 4685; Waterval Boven, Carolina, *Burt-Davy* 1425; Schweizer Reneke, Bloemhof, *Burt-Davy* 1653, 1682; Christiana, Bloemhof, *Burt-Davy* 14129, 14152.

A coarse wiry grass of little value, except when quite young.

LXXIV. **DIPLACHNE**, Beauv. (337).

Spikelets shortly pedicelled or sessile, somewhat distant or remote on the simple slender branches of a panicle; rhachilla disarticulating above the glumes and between the valves, glabrous. Florets 2-10, ♂, or the uppermost reduced. Glumes unequal or subequal, membranous, 1-nerved, keeled, persistent. Valves oblong to linear-oblong, 2-toothed or minutely notched, rarely quite entire, muticous or mucronulate from the sinus, very rarely shortly awned from below the apex, membranous, 3-nerved, usually finely ciliate in the lower part of the nerves or sometimes quite glabrous; side nerves percurrent or almost (or sometimes very shortly) excurrent. Pales 2-keeled, shorter than the valves. Lodicules 2, cuneate, fleshy, nerved. Stamens 3. Ovary glabrous. Styles distinct, slender. Stigmas plumose, laterally exerted. Grain enclosed by the slightly altered valve and pale, oblong to obovoid-oblong, dorsally compressed, sometimes quite flat, rarely terete; embryo equalling third to half the length of the grain; hilum punctiform, basal.

Mostly perennial; tufted, somewhat coarse grasses; blades long, narrow, flat or involute; ligules membranous, sometimes reduced to a rim; panicles consisting of slender usually long, simple, loosely spike-like and more or less distant branches; spikelets light, or olive-green, often tinged with purple and dark.

D. fusca, Beauv.

Skidders Court, Pretoria, *Stent* in *Nat. Herb.* H. 3367; Mosdene, Naboomspruit, Waterberg, *Galpin* M. 540; Christiana, Bloemhof, *Burt-Davy* 11410, 12788.

D. biflora, Hack.

Eloff's Plantation, Pretoria, *Macdonald* in *Nat. Herb.* H. 5446; Meintjes Kop, Pretoria, *Burt-Davy* in *Nat. Herb.* H. 3546; Tzaneen, Zoutpansberg, *Sampson* in *Nat. Herb.* H. 4427; downs, Zoutpansberg, on open veld, *Junod* 4106; Waterval Boven, Carolina, *Burt-Davy* 1407.

LXXV. **ERAGROSTIS**, Beauv. (341).

Spikelets usually strongly laterally compressed, pedicelled in open or contracted panicles, rarely sessile in simple or compound spikes, very rarely articulate on the pedicels; rhachilla disarticulating above the glumes and between the valves or tough and persistent, glabrous, sometimes more or less scaberulous, very rarely minutely hairy. Florets 2 to many, ♂, or the uppermost reduced. Glumes unequal or equal, usually membranous,

1-nerved, or the upper sometimes 3-nerved, keeled, persistent or deciduous. Valves more or less imbricate, ovate to lanceolate, acute to obtuse, entire, mucicous, membranous to chartaceous, 3-nerved, glabrous, very rarely minutely pubescent; side nerves short or almost percurrent. Pales equal to the valves or slightly shorter, membranous, 2-keeled, deciduous or persistent on the rhachilla. Lodicules 2, small, cuneate, more or less fleshy. Stamens 3, rarely 2. Ovary glabrous. Styles distinct. Stigmas plumose, laterally exerted. Grain enclosed by the scarcely altered valve and pale and deciduous with them, or more commonly falling with the deciduous valve, leaving the more or less persistent pale behind, oblong to obovoid or globose, round or very obtusely triquetrous or quadrangular in cross-section; pericarp thin, sometimes slightly swelling or separating; embryo often half as long as the grain (or sometimes longer); hilum punctiform, basal.

Perennial or annual, of very varying habit; blades narrow; ligule reduced to a fringe of usually minute hairs; panicles lax to effuse or contracted to spike-like, or transformed into simple or compound spikes; spikelets usually more or less olive-green or olive-grey breaking up variously, very rarely deciduous as a whole.

E. caesia, Stapf.

Belfast, Lydenburg, *Burt-Davy* 1344.

E. curvula, Nees.

Skidders Court, Pretoria, *Burt-Davy* 4375, 4365; *Stent* in *Nat. Herb. H.* 5162; Irene, near Pretoria, *Burt-Davy* 32; Germiston, *Fenn* 8742; Elsbury, Witwatersrand, *Rogers* 12147; near Nylstroom, Waterberg, *Burt-Davy* 2065; Mosdene, Naboomspruit, Waterberg, *Galpin* M. 451; Zoutpansberg, *Methuen* in *Nat. Herb. H.* 8802; Belfast, Lydenburg, *Burt-Davy* 1327; Helvetia, near Machadodorp, Lydenburg, *Burt-Davy* 7246; Carolina, *Burt-Davy* 2986, 7389, 2961; Athol, Ermelo, *Macdonald* in *Nat. Herb. H.* 98; Potchefstroom, *Burt-Davy* 2166; Welverdiend, Potchefstroom, *Burt-Davy* 14563; Vlaktefontein, Amersfoort, Wakkerstroom, *Burt-Davy* 4146.

A useful pasture grass.

E. lehmanniana, Nees.

Pyramid Estate, near Potgieters, Waterberg, *Galpin* 8904; Crocodile River, Rustenburg, *Burt-Davy* 9301; Schweizer Reneke, Bloemhof, *Burt-Davy* 1651, 1637; Christiana, Bloemhof, *Burt-Davy* 14139, 14149, 13447.

E. chloromelas, Steud.

Skidders Court, Pretoria, *Stent* in *Nat. Herb. H.* 4362; Irene, near Pretoria, *Burt-Davy* 3847; Meintjes Kop, Pretoria, *Burt-Davy* 3945; Lydenburg, *Schlechter* 3969; Panplaats, Pan Station, Middelburg, *Burt-Davy* 13331; Ermelo, *Tennant* in *Nat. Herb. H.* 6954; Davel, Ermelo, *Burt-Davy* 1656; Standerton, *Burt-Davy* 3319; Potchefstroom, *Burt-Davy* 1478; Christiana, Bloemhof, *Burt-Davy* 11701; Schweizer Reneke, *Burt-Davy* 1640.

E. chloromelas would appear to be a very variable species—some of the specimens quoted above are very dissimilar in appearance and yet agree, more or less, with Stapf's description of the species. Many of the specimens previously placed under *E. chloromelas*, *E. nebulosa*, or *E. curvula* in the National Herbarium I have separated out into distinct groups which appear to me to represent distinct species. These I am recording below simply as sp. A, sp. B, etc., pending a revision of the whole genus.

E. sp. A.

Potchefstroom, *Burt-Davy* 844; Schweizer Reneke, *Burt-Davy* 1643.

A species with a rather stout, leafy culm, erect or geniculate, basal sheaths up to 9 cm. long, rigidly convolute leaves, long, rather contracted panicle and narrow linear, few-flowered spikelets.

E. sp. B.

Skidders Court, Pretoria, *Burt-Davy* 3557.

Densely caespitose, with rigid basal sheaths, slender culms, rigidly convolute leaves, spreading ovoid panicle, and broader and rather obtuse few-flowered spikelets.

E. sp. C.

Uitgevalen, Heidelberg, *Burt-Davy* 13659; Beginsel Farm, Standerton, *Burt-Davy* 927, 1018; Christiana, Bloemhof, *Burt-Davy* 13062.

Densely caespitose, with short, whitish, rather thin basal sheaths, finer leaves, panicle ovate spreading or slightly contracted, and rather short contracted branchlets.

E. sp. D.

Henley-on-Klip, *Stent* in *Nat. Herb. H.* 21128; Pyramid Estate, Potgietersrust, *Galpin* 8901.

In habit very like sp. B, and may be the same species with narrower spikelets.

E. sp. E.

Welverdiend Station, Potchefstroom, *Burt-Davy* 14598; Christiana, Bloemhof, *Burt-Davy* 13062; Machavie Station, Potchefstroom, *Burt-Davy* 1481.

Near to *E. Burchellii* (ex descr.), but spikelets 4-7-flowered, keels of the valves scabrid.

E. sp. F.

Meintjes Kop, Pretoria, *Pole Evans* 438; Henley-on-Klip, Heidelberg, *Stent* in *Nat. Herb. H.* 21146; Pyramid Estate, Potgietersrust, *Galpin* 8901.

Culms slender, $1\frac{1}{2}$ to 2 ft. high—leaves very narrow and setaceously convolute and flexuous, panicle delicate with numerous very fine capillary divisions and scattered, 2-4-flowered, spikelets, conspicuously white bearded in the axils of the branches and branchlets

A very distinct species.

E. sp. G.

Gezina, Pretoria, *Stent* in *Nat. Herb. H.* 21470; Pyramid Estate, near Potgietersrust, *Galpin* 8903; Mosdene, Naboomspruit, Waterberg, *Galpin* M. 453.

E. nebulosa, Stapf.

Vlakfontein, Ermelo, *Burt-Davy*, 4164; Uitgevalen, Heidelberg, *Burt-Davy* 13672.

E. porosa, Nees.

Christiana, Bloemhof, *Burt-Davy* 12795, 12803.

E. bicolor, Nees.

Pyramid Estate, Potgietersrust, *Galpin* 8899; Springbok Flats, Waterberg, *Burt-Davy* 1132.

E. Wilmsii, Stapf.

In moist places near Pretoria, *Schlechter* 4155.

E. Burttdavii, Stent (in *Bothalia*, I, 176).

Bloemhof, *Burt-Davy* 10506.

E. sporoboloides, Stapf.

Pretoria, *Macdonald* in *Nat. Herb. H.* 5478; near Bamboesspruit, Bloemhof, *Burt-Davy* 1519.

MacDonald's specimen has a panicle 15 cm. long and often 5-flowered spikelets and may, when the revision of the genus is undertaken, have to be placed under a separate species.

E. atherstonei, Stapf.

Mosdene, Naboomspruit, Waterberg, *Galpin* M. 443; Warmbaths, Waterberg, *Burt-Davy* 859; Pyramid Estate, Potgietersrust, Waterberg, *Galpin* 8902; near Christiana, Bloemhof, *Burt-Davy* 1608.

One of the dominant grasses round Vryburg, Cape Province, and found mostly in association with *E. lehmanniana*. Atherston's specimen from Lydenburg in the Kew Herbarium, on which Stapf founded the species, is very poor and not typical of the grass—it has a narrow panicle, erect unbranched culms, and 3-4-flowered spikelets. Round Vryburg, where the grass is abundant, the culms are usually geniculate and much-branched and the panicles often 8 cm. broad and 17 cm. long, while glands are not always present below the nodes. There is no doubt, however, that the grass collected by Atherston at Lydenburg is the same as those quoted above and as the Vryburg grass.

E. plana, Nees.

Pretoria, *Burt-Davy* 827; near Nylstroom, Waterberg, *Burt-Davy* 1998, 2082; Pyramid Estate, Potgietersrust, *Galpin* 8897; Mosdene, Naboomspruit, *Galpin* M. 538; Houtboschberg, *Burt-Davy* 1256; Vlaktefontein, near Amersfoort, Wakkerstroom, *Burt-Davy* 4011; Standerton, *Burt-Davy* 889; Carolina, *Burt-Davy* 2964; Lake Chrissie, Ermelo, *Hamilton* in *Nat. Herb.* H. 5909.

“Os-gras.” “A hard, wiry, tufted grass, much grazed, when young, by horses, mules, and oxen, but soon becoming too hard and wiry.”—*Burt-Davy*.

“Only grass I have found that can hold its own with Kikuyu.”—*MacCallum*.

E. biflora, Hack.

Mosdene, Naboomspruit, Waterberg, *Galpin* M. 445; Mailas Kop, *Schlechter* 4559.

E. sp. H.

Turfontein, Johannesburg, *Bryant* B. 68; Uitgevalen, Heidelberg, *Burt-Davy* 9139; Vierfontein, Schweizer Reneke, Bloemhof, *Burt-Davy* 1647.

Annual; near to *E. bicolor*, but taller and more robust with larger spikelets of usually 3 florets. Rhachilla continued beyond the terminal floret.

E. Galpinii, Stent (in *Bothalia*, I, 176).

Mosdene, Naboomspruit, Waterberg, *Galpin* M. 456; Pyramid Estate, near Potgietersrust, Waterberg, *Galpin* 8900; near Nylstroom, Waterberg, *Burt-Davy* 2034; Warmbaths, Waterberg, *Burt-Davy* 1149; Letaba River, Zoutpansberg, *Junod* 2350.

E. patentissima, Hack.

Experiment Farm, Ermelo, *Burt-Davy* 9364.

E. denudata, Hack.

Groenkloof, Pretoria, *Phillips* H. 21682; Warmbaths, Waterberg, *Burt-Davy* 1144; Vierfontein, Schweizer Reneke, Bloemhof, *Burt-Davy* 1624; Christiana, Bloemhof, *Burt-Davy* 12992, 14130, 11412, 11397.

E. sclerantha, Nees.

Spionkop, Ermelo, *Burt-Davy* 9240; Booth and Bell in *Nat. Herb.* H. 3400; Grasdale, Ermelo, *Burt-Davy* 9263.

E. chalcantha, Trin.

Eloff's Plantation, Pretoria, *Macdonald* in *Nat. Herb.* H. 5447; Sunnyside Kopjes, Pretoria, *Macdonald* in *Nat. Herb.* H. 5457; Skinners Court, Pretoria, *Burt-Davy* 3805; Ermelo, *Burt-Davy* 1668; Derby Station, Marico, *Burt-Davy* 7167; Beginsel Farm, Standerton, *Burt-Davy* 930, 1017; Blesbokspruit, Ermelo, *Burt-Davy* 951; Henley-on-Klip, Heidelberg, *Stent* in *Nat. Herb.* H. 21136; Uitgevalen, Heidelberg, *Burt-Davy* 9159; Pan Station, Middelburg, *Burt-Davy* 13308; near Zeerust, Marico, *Burt-Davy* 7193; downs, Zoutpansberg, *Junod* 4097, 4102; Potchefstroom, *Burt-Davy* 1066; Vaal River, Bloemhof, *Burt-Davy* 1506.

“A short leafy grass, common on Rooi grasveld and giving a nice leafy bite for sheep.”—*Burt-Davy*.

E. pallens, Hack.

Mosdene, Naboomspruit, Waterberg, *Galpin* M. 459 ; Vaal River, Bloemhof, *Burtt-Davy* 1058 ; near Christiana, Bloemhof, *Burtt-Davy* 9623.

Burchell's 2190, on which Stapf has founded his species *E. dura*, is an undeveloped specimen of *E. pallens*.

E. major, Hack.

Hamanskraal, Pretoria, *Burtt-Davy* 1092 ; Mosdene, Naboomspruit, Waterberg, *Galpin* M. 462 ; Warmbaths, Waterberg, *Burtt-Davy* 1143 ; Standerton, *Burtt-Davy* 1782 ; Vlakkfontein, Amersfoort, Wakkerstroom, *Burtt-Davy* 4056 ; Potchefstroom, *Burtt-Davy* 1216.

"Stink gras," an introduced weed.

E. barbinodis, Hack.

Wonderboom, Pretoria, *Pole Evans* in *Nat. Herb.* H. 21472 ; Hamanskraal, Pretoria, *Burtt-Davy* 1087 ; Mosdene, Naboomspruit, Waterberg, *Galpin* M. 450, 455 ; Naboomspruit, *Mogg* in *Nat. Herb.* H. 11665 ; near Nylstroom, *Burtt-Davy* 2066, 1997 ; Krabbefontein, Tzaneen, Zoutpansberg, *Burtt-Davy* 2368.

Perennial ; often with long surface stolons that root at the nodes and send up fascicles of barren shoots and flowering culms. Panicle often more or less contracted and up to 20 cm. long.

E. superba, Nees.

Skinners Court, Pretoria, *Burtt-Davy* 5104 ; Hamanskraal, Pretoria, *Burtt-Davy* 1093 ; Mosdene, Naboomspruit, Waterberg, *Galpin* M. 463 ; Springbok Flats, Waterberg, *Burtt-Davy* 9078 ; Warmbaths, *Burtt-Davy* 2227 ; Komatipoort, Barberton, *Burtt-Davy* 371 ; near Magatas Nek, Zoutpansberg, *Burtt-Davy* 152 ; Christiana, Bloemhof, *Burtt-Davy* 14140, 14095.

E. brizoides, Nees.

Eloff's Plantation, Pretoria, *Macdonald* in *Nat. Herb.* H. 5475 ; Skinners Court, Pretoria, *Burtt-Davy* 1181 ; The Willows, Pretoria, *Burtt-Davy* 4490 ; Houghton Estate, Johannesburg, *Bryant* C. 34 ; Pyramid Estate, Potgietersrust, *Galpin* 8906 ; Tzaneen, Zoutpansberg, *Sampson* in *Nat. Herb.* H. 4463 ; crags and downs, Zoutpansberg, *Junod* 4095 ; Belfast, Lydenburg, *Burtt-Davy* 1374 ; Amersfoort, Wakkerstroom, *Burtt-Davy* 9047 ; Uitgevallen, Heidelberg, *Burtt-Davy* 9163 ; Beginsel Farm, Standerton, *Burtt-Davy* 3079 ; Amsterdam, Ermelo, *MacDonald* in *Nat. Herb.* H. 100 ; Ermelo, *Burtt-Davy* 3877, *Tennant* in *Nat. Herb.* H. 6970, *Burtt-Davy* 3917.

E. obtusa, Munro.

Skinners Court, Pretoria (cult. ?), *Aaron* in *Nat. Herb.* H. 7902 ; Potchefstroom, *Burtt-Davy* 1064 ; Christiana, Bloemhof, *Burtt-Davy* 12497, 1512, 11411.

E. lappula, Nees, var. *divaricata*, Stapf.

Skinners Court, Pretoria, *Burtt-Davy* 1021 ; Potgietersrust, Waterberg, *Burtt-Davy* 2400.

E. aspera, Nees.

Potgietersrust, Waterberg, *Burtt-Davy* 2418 ; Magoebas Kloof, Zoutpansberg, *Mogg* in *Nat. Herb.* H. 10668 ; Mosdene, Naboomspruit, Waterberg, *Galpin* M. 446 ; Tzaneen, Zoutpansberg, *Sampson* in *Nat. Herb.* 4443.

E. gummiflua, Nees.

Skinners Court, Pretoria, *Burtt-Davy* 3806 ; Turffontein, Johannesburg, *Bryant* D. 5 ; Mosdene, Naboomspruit, Waterberg, *Galpin* M. 457 ; Pyramid Estate, Potgietersrust, Waterberg, *Galpin* 8905 ; Springbok Flats, Waterberg, *Burtt-Davy* 1127 ; Warmbaths, Waterberg, *Burtt-Davy* 1146 ; Potgietersrust, *Burtt-Davy* 2340 ; downs, Zoutpansberg, *Junod* 4105 ; Waterval Boven, Carolina, *Burtt-Davy* 1440 ; Ermelo, *Burtt-Davy* 1658 ; Potchefstroom, *Burtt-Davy* 1070 ; Christiana, Bloemhof, *Burtt-Davy* 12785, 14153.

E. ciliaris, Link.Barborton, *Burt-Davy* 8012.**E. namaquensis**, Nees.Pyramid Estate, Potgietersrust, *Galpin* 8896 ; Mosdene, Naboomspruit, *Galpin* M. 539.**E. viscosa**, Trin. (Mem. Acad. Petersb., Ser. VI, i, 1831, 397).Pyramid Estate, Potgietersrust, *Galpin* 8908.**E. abyssinica**, Schrad. [Linnaea XII (1838), 450].Skinners Court, Pretoria, *Burt-Davy* 2126 ; Groenkloof, Pretoria, *Goodwin* in *Nat. Herb.* H. 8782 ; Mosdene, Naboomspruit, Waterberg, *Galpin* M. 440 ; Wel-verdiend Station, Potchefstroom, *Burt-Davy* 14596.

Escape from cultivation—"Teff."

LXXVI. **KOELERIA**, Pers. (346).

Spikelets laterally compressed in spike-like panicles ; rhachilla glabrous or finely hairy, disarticulating above the glumes and between the valves, produced with or without a rudimentary valve. Florets 1-5, ♂, or the uppermost more or less reduced. Glumes 2, persistent, subequal or unequal, subacute to acuminate, keeled, the lower usually 1-nerved or like the upper 3-nerved, margins hyaline. Valves exceeding the glumes, acute or obtuse with the margins and tips broadly hyaline, 3-5-nerved ; side nerves usually faint, conniving above, middle nerve percurrent or excurrent into a mucro or a short subterminal awn ; callus very minute, glabrous. Pales shorter than the valves or almost as long, 2-keeled, 2-toothed, conspicuously hyaline and white. Lodicules 2, hyaline. Stamens 3. Ovary glabrous. Styles distinct, very short. Stigmas laterally exerted, plumose. Grain oblong, laterally compressed, whitish, soft, tightly embraced by the hardened back of the valve ; hilum basal, short, obscure ; embryo small.

Perennial or annual ; blades usually very narrow ; ligules hyaline ; panicle usually cylindric, often interrupted, glabrous and glistening from the hyaline white margins of the valves and pales, or more or less hairy.

K. cristata, Pers.Skinners Court, Pretoria, *Stent* in *Nat. Herb.* H. 4364 ; Leeuwpoort, Carolina, *Burt-Davy* 7438 ; Ermelo, *Burt-Davy* 5467 ; near Amersfoort, Wakkerstroom, *Burt-Davy* 4130 ; Volksrust, Wakkerstroom, *Burt-Davy* 5354 ; Vlaktefontein, Wakkerstroom, *Burt-Davy* 9038.LXXVII. **STIBURUS**, Stapf (371A).

Spikelets laterally compressed, subsessile or shortly pedicelled, in spike-like cylindric panicles ; rhachilla disarticulating above the glumes and between the valves. Florets 4-5, ♂, the uppermost reduced, shortly exerted from the glumes. Glumes equal or subequal, membranous, lanceolate, caudate-acuminate, 1-nerved. Valves very similar to the glumes, but 3-nerved ; callus very minute. Pales shorter than the valves, 2-keeled. Lodicules 2, minute, hyaline, cuneate. Stamens 3. Ovary glabrous. Styles short, distinct. Stigmas plumose, laterally exerted. Grain enclosed by the hardly changed valve and pale, free, oblong, terete ; embryo short ; hilum basal, punctiform.

Perennial ; tufted ; blades very narrow, usually subsetaceous, long ; ligule a ciliate rim ; panicle cylindric, dense, usually dark purple, greyish-villous.

S. alopecurioides, Stapf.Houtbosch, *Schlechter* 4747.

LXXVIII. **POA**, Linn. (378).

Spikelets mostly 2-6-flowered, in loose or close (rarely in spike-like) panicles; rhachilla disarticulating above the glumes and between the valves, glabrous or scantily and minutely hairy; flowers hermaphrodite or the upper imperfect. Glumes thin, membranous, keeled, acute or obtuse, 1-3-nerved. Valves membranous, sometimes rather firm, obtuse or acute, 5-7-nerved; callus small, obtuse, often with a tuft of long wool. Pales shorter than the valves, 2-keeled. Lodicules 2, more or less 2-lobed. Stamens 3. Ovary glabrous. Styles short, free. Stigmas plumose, laterally exserted. Grain ovoid, oblong or linear, often grooved, free or adherent to the pale; hilum punctiform, basal; embryo small.

Annual or perennial; blades flat and flaccid or convolute, and more or less rigid; ligules hyaline; panicles open, often effuse, rarely contracted, spike-like; spikelets rather small, awnless.

P. annua, L.

Irene, near Pretoria, *Van der Byl* in *Nat. Herb.* H. 5258; Lydenburg, *Burt-Davy* 401; Belfast, *Burt-Davy* 1390; Caledon, Lake Chrissie, Ermelo, *Hamilton* in *Nat. Herb.* H. 6740; Volksrust, Wakkerstroom, *Meyer* in *Nat. Herb.* H. 7783; Potchefstroom, *Burt-Davy* 1034.

LXXIX. **BROMUS**, Linn. (389).

Spikelets laterally compressed, at least, after flowering, variously paniced; rhachilla disarticulating above the glumes and between the valves. Florets usually numerous, ♂, the uppermost reduced. Glumes more or less unequal, acute to acuminate, persistent, lower 1-7-, upper 3-9-, nerved, and sometimes mucronate or aristulate. Valves lanceolate or broadly oblong, rounded on the back or keeled, 5-13-nerved, usually awned; awn terminal (rarely 3 or 0) or somewhat distant from the often 2-toothed tip, straight or recurved and then often loosely twisted below, not kneed. Pales entire or bifid; keels usually rigidly ciliolate or ciliate. Lodicules 2, oblong or lanceolate, entire or lobed. Stamens 3, rarely 2. Ovary obovoid with an often large, villous, 3- or 2-lobed terminal appendage. Styles short, lateral on the appendage. Stigmas plumose, laterally exserted, or in the cleistogamic species permanently enclosed. Grain linear to linear-oblong, convex-concave, and usually adherent to the valve and pale, or at least to the latter; hilum filiform long; embryo small.

Annual or perennial, or very varying habit; blades linear, flat, often flaccid; ligules membranous, hyaline; panicle contracted, often very dense, or open, and even effuse, or reduced to a raceme; spikelets rather large, erect or pendulous, from ovoid to linear-cuneate; awns very long or short, sometimes reduced to a mucro or 0.

B. leptocladius, Nees.

Groenkloof, Pretoria, *Burt-Davy* 10958; Ermelo, *Burt-Davy* 4166; Volksrust, Wakkerstroom, *Nourse* in *Nat. Herb.* H. 6196.

B. unioides, H. B. K.

Irene, near Pretoria, *Burt-Davy* 3841; Lydenburg, *Burt-Davy* 413; Vlakfontein, Amersfoort, Wakkerstroom, *Burt-Davy* 9035; Kolonies Plaats, Potchefstroom, *Burt-Davy* 9080.

"Rescue grass" (naturalized). One of the best winter grasses, relished by all stock, susceptible to smut in the Karroo.

B. tectorum, Linn.

Skinners Court, Pretoria, *Burt-Davy* 1909.

B. inermis, L.

Groenkloof, Pretoria, *Melle* in *Nat. Herb.* H. 11555.

With the exception of *B. unioides*, which is known as Rescue or Prairie grass, the *Bromus* spp. are introduced weeds.

LXXX. **LOLIUM**, Linn. (395).

Spikelets usually more or less compressed, 2-ranked, alternate, sessile in the hollows of the rhachis of a simple spike; rhachilla glabrous, disarticulating above the glumes and between the valves. Florets 3-11, or sometimes more, ♂ or the uppermost reduced. Glumes of terminal spikelets equal and similar, lower suppressed in the lateral spikelets, upper linear to oblong, obtuse to acute, flat or slightly rounded, coriaceous, prominently 7-9-nerved. Valves oblong, rounded on the back, subobtusely, minutely 2-toothed (or acute in profile), more or less chartaceous except at the short hyaline tips, glabrous, 5-nerved, mucous or awned; awn a straight bristle from close to the tip. Pales equalling the valves or nearly so, 2-keeled, keels more or less crested. Stamens 3. Lodicules 2, lanceolate with a lateral tooth. Ovary glabrous, truncate. Styles distinct, very short. Stigmas laterally exerted, plumose. Grain elliptic-oblong to linear-oblong, tightly enclosed by the valve and pale, adhering to both; embryo short; hilum linear, almost as long as the grain.

Annual or perennial; blades linear, flat; ligules hyaline; spikes terminal; spikelets more or less erect, 2-ranked, with the (upper) glume opposite the hollow of the rhachis.

L. temulentum, L.

Onderstepoort, Pretoria, *Burt-Davy* in *Nat. Herb.* H. 5105; Zwartkoppies, Pretoria, *Burt-Davy* 7095; Vogelfontein, near Germiston, Witwatersrand, *Macdonald* in *Nat. Herb.* H. 6675; Ermelo, *Burt-Davy* 3889; Belfast, Lydenburg, *Lewis* in *Nat. Herb.* H. 5007; Amersfoort, Wakkerstroom, *Robertson* in *Nat. Herb.* H. 16576; Potchefstroom, *Burt-Davy* 852, 1762.

"Darnel" (drabok). A weed in grain fields; injurious to stock and to humans.

L. multiflorum, Lam.

Koloneis Plaats, Potchefstroom, *Burt-Davy* 9086.

Perennial rye-grass—escape from cultivation.

LXXXI. **OROPETIUM**, Trin. (398).

Spikelets sessile, solitary, more or less immersed in the hollows of the rhachis of a simple distichous terminal spike; rhachilla very slender, glabrous, disarticulating above the glumes and between the valves. Florets 1-4, ♂, or uppermost rudimentary, shorter than the upper glume. Glumes of terminal spikelet equal and similar, lower glume of the lateral spikelets suppressed or (if present) more or less reduced, sometimes split in two, upper very narrow, rigid, except at the hyaline margins, subacute to acuminate, 1-3-nerved, nerves often more or less confluent into a broad rigid midrib. Valves oblong or lanceolate in profile, elliptic to broadly oblong when expanded, distinctly or obscurely keeled, at least in the upper part, truncate or minutely 3-toothed, hyaline, glabrous, hairy along the nerves, finely 3-nerved; callus bearded. Pales equalling the valves, faintly 2-nerved. Lodicules 2, minute, cuneate. Stamens 3. Ovary glabrous. Styles slender, distinct. Stigmas laterally exerted. Grain oblong, subterete or slightly compressed from the sides; embryo about one-third the length of the grain; hilum punctiform, basal.

Dwarf, densely tufted perennials, rarely annuals; blades setaceous; ligule hyaline, ciliate, short; spikes very slender, straight or gradually curved; spikelets closely or loosely 2-ranked on the opposite or subopposite sides of the rhachis.

O. capense, Stapf.

Christiana, Bloemhof, *Burt-Davy* 12782.

