OUR GRASSES (Queensland).

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However loth some may be to allow it, the foundation of this country's wealth lies in these plants. In old writings, as well as those of the present day, many plants are called grasses which do not belong to the Order called *Gramineæ* by botanists, but this order in its restricted sense is of the whole vegetable kingdom that most useful to man, and we also find it the most widely spread of *Phænogamous* plants, covering the face of the globe, producing food for man and beast from the poles to the equator. The numbers of species also are very great, and with regard to size, while many attain but the height of a few inches, there are some which rival that of forest trees. Much might be said of the various uses to which this valuable family is applied, but all attempted in this paper is to draw some little attention to our pasture grasses. As only those known to the writer are noticed, doubtless a large number of species are left for further observation, while from those mentioned an idea of the richness of Queensland pasture can be formed. I have endeavoured to arrange the species more with regard to their general habitat than to natural affinity, which I think will be an advantage to persons who may wish to collect seeds of the species under notice for the purpose of proving under cultivation their real value.

Let us notice in the first place a few of our grasses which may be termed Aquatic species, for they are generally found in swamps or along water-courses. *Leersia Australis* of Robt. Brown, which the learned botanist of Victoria, Baron von Mueller, who of late has given much attention to this order of plants, finds to be identical with Swartz's *L. hexandra.* It is the species most generally met with;a quick growing productive grass. It seems to be well relished by cattle. It is also botanically interesting on account of having six stamens, being double the number of male organs usually found in the grasses. *Poa aquatica, L.* the water-meadow grass, may be often met with on our marsh lands; this is a fine succulent grass and crops well, but cattle are apt to pull it up, and thus prevent it from producing seed that otherwise it would do in abundance. *Panicum atrovirens,* Tri., may be met with in several of the creeks near Doughboy. It is one of the prettiest of our indigenous grasses, and promises a very fair amount of fodder and seed.

In most of our swamps will be seen a wiry growing grass

with upright spikes of seed, to which many small birds seem partial; this is Robt. Brown's *Panicum phleoides*, but according to *Fragmenta Phytographiæ Australiæ*, Vol. viii., page 197, Baron von Mueller finds it identical with *Panicum indicum* of *Linnæus*. When introduced on to good land the wiry character is lost, and it forms a good sward.

Of all the species found on our low lands none equal for fodder a variety of *Panicum Crus Galli Linn. Echinochloa stagnina* of *Palisot de Beauvois ;* in its natural state it will be found in or around stagnant water of from 2 to 3 feet in height, but when cultivated it attains the height of 5 or 6 feet, the fodder being equal to any of the introduced *Sorghums*. *Panicum virgatum Linn.* is another species found along water-courses and in swamps; it produces a fine succulent fodder, but not equal to the last mentioned. This species is also common on the Darling Downs, where it is known as umbrella-grass.

Pennisetum compressum of R. Brown's Prod. This species forms large tufts of grass of a rather coarse nature. When in flower it will be easily recognised by its purple bottle-brush-like spikes. With this may be classed Robt. Brown's *Cenchrus australis*, a swamp and scrub grass, readily eaten by cattle until its burr-like seeds appear. The broad-leaved variety of this grass, found on the banks of the Pioneer River and other parts of Northern Queensland, is much more succulent, and produces a large quantity of coarse fodder.

* *Phragmites communis* Tri. The common reed is abundant along most of our rivers, and although not a fodder, still is useful for thatching, etc. *Andropogon muticus Steudel.* When fully grown this species becomes very harsh, but in the early stage of its growth it produces a fair quantity of feed ; entirely a swamp species. *Andropogon triticeus* R. Br., the tallest of all our grasses is only found within the tropics, where the flower stalks often stand 10 or more feet high, bearing several spikes of flowers resembling ears of wheat. This is the spear grass of the tropic, and is well named, for its awns are often 4 or more inches long ; it produces a large quantity of bottom feed, and is only found on rich land. The common blady grass* *Imperata arundinacea* of *Cyril*, one of the most frequently met with grasses on rich land, and indeed the commonest grass of the north, produces in a young state a large quantity of feed. On salt marshes or brackish land will often be seen a large quantity of the stiff harsh grass, **Hemarthria compressa* of Robt. Brown, although coarse, this kind produces a great deal of feed. In company with this another very superior species, *Sporobolus pallidus*, will often be seen keeping up a good sward until well on into the summer month, when it is generally overrun by Dr. Robt. Brown's *Paspalum littorale;* of

this there are two distinct varieties, the one being found near salt, the other near fresh water. This latter variety is perhaps the most succulent and beautiful of all our summer grasses, but neither are seen much of during the winter. According to Baron Mueller these two varieties are identical with an Indian grass *Paspalum distichum* of *Linnæus*.

I will next notice a few species generally to be met with on broken ground such as the borders of scrubs, banks of rivers, or similar situations, and here we shall doubtless find many that it would be well to introduce into the pasture lands. For instance, the beautiful *Poa chinensis* of *Kœnig*, which may be seen plentifully on the banks of Doughboy Creek and the Brisbane River, is a species well worth cultivating. It is easily known by its feather-like drooping panicle.

* *Stipa Dichelachne* of *Steudel* is also a valuable species, on account of its producing feed all the year round. It is a free seeder, and may be easily known by its upright, light colored panicle. The broad-leaved *Panicum foliosum*, R. Br., must not be looked over, for it is one of the best grasses on the river bank. * *Festuca Billardieri* of *Steudel*, a grass often found on the borders of scrubs is rather too harsh to recommend for fodder, although it seems to be liked by some persons on the Darling Downs. *Forster's Agrostis ovata*, *Cinna ovata* of *Kunth* is another harsh species common to our river banks, but which cannot be spoken of as a fodder grass. I shall speak of the bulk of our grasses under the name of pasture species, because if we notice a paddock cleared of its timber and rubbish, so that the natural grasses have a chance, they show themselves even on the very worst land—the ironbark forests for instance. In a marvellously short time the whole is covered with a luxuriant sward, thus proving all useful for pastoral purposes. But as there are some few kinds of grasses oftener met with in one situation than another, it will be well to note these. Thus there are a few species which we generally fall in with on the dry ridges, as the beautiful close-growing *Andropogon falcatus* of *Steudel*, which, from its compact dwarf growth and rich color, should recommend itself as a valuable lawn grass. Here we also find the prolific seed bearer, *Panicum brizoides* of *Linnæus*. The stalks of this grass are mostly prostrated by the weight of seed; in company with these will be found, especially on forest land, the sparsely-leaved upright growing *Panicum marginatum*, R. Br., and its nearly allied species, *Panicum strictum*, R. Br. This latter species is of a darker green, and not so hairy. *Panicum bicolor*, R. Brown, is another grass often met with on the dry ridges; and also all over the hills will be seen the fine pasture grass *Panicum parviflorum*, R. Br. Of this there are also two fine

varieties, the one with large spreading panicles, and the other having only one or two very long erect spikelets in its panicle. All three are well worth cultivating, and they will be easily recognised from the dark color of the small seeds. *Panicum tenuiflorum*, R. Br., has a running stem and broad leaf, and forms a good bottom. This species is easily known by its weak stalks, and two spikelets; the seed also is of a light color. Two grasses, also common in ironbark forests, are *Aristida vagans* and *A. calycina*. According to Dr. Robt. Brown's *Prodromus*, these two grasses make a good bottom, although their stalks are dry and harsh. The terminal three awns to the seed distinguish the genus. And these two species may be known from each other, by the latter having a drooping panicle, and being of a lighter color than the former. In company with these will always be found the fine pasture grass, *Sporobolus elongatus*, Robt. Brown. This species is not confined to the hills, but is met with in all directions. This species has a very long narrow panicle. On the damp side of the hills will be met with during the greater part of the year, a very pretty grass; the four stamens of the flowers will readily point the species out. This is Robt. Brown's **Microlæna stipoides*, also known by *Labillardier's* name, * *Ehrharta stipoides*. Here also will be found the handsome *Andropogon gryllus* of *Linnæus*. Trinius named it *Chryspogon gryllus*, from its golden beard. It is a useful fodder species. On the open hillsides our old friend, the kangaroo grass, *Anthistiria australis*, R. Brown, is met with in abundance, and in similar situations at the north will be found the **Anthistiria ciliata* of *Linnæus*. This species makes a much greater quantity of leaf. Brown's *Panicum decompositum*, which Baron Mueller finds identical with an American species, *Panicum capillare*, *Gronv.*, is a most productive grass, and is found pretty generally throughout the colony. *Panicum coloratum*, *Linn*; this is very similar to the last, but its large panicle is of a dark color. The well-known annual summer grass, *Panicum ciliare*, *Retz*, all will agree in pronouncing a most prolific species. The most common grass of our flat open country is *Andropogon refractus*, R. Br., a species that may be known by the spikelets being suddenly bent backwards as if broken. This is a fine productive summer grass, but little is seen of it during the cold months. The same may be said of the species commonly called blue grass, *Andropogon sericeus*, of Brown's *Prodromus*, and *Andropogon affinis*, R. Br.; but *Andropogon pertusus*, *Willd.*, stands the cold much better, though somewhat similar to the two last named species; this may be recognised at once by the little pit on the glume. *Panicum semialatum*, R. Brown, a very widely spread species, is an excellent pasture

grass. The species is easily distinguished by its tall stalks, and two or three stout often colored spikelets; this species stands the winter pretty well. Another grass that will stand through the winter well is *Helopus annulatus, Nees.* There are two varieties of this fine grass, both equally good. This species is of a much lighter green than most others. **Agrostis solandri,* F. v. Mueller, is an early annual grass, and produces a large quantity of sweet herbage. This species is not very common about Brisbane, but is plentiful on strong wet land, as Darling Downs. *Brown's Poa parviflora* is an annual grass found springing up in all directions, producing a sweet tender herbage at most seasons of the year. It is the light panicles of these two, and the next species, that are often seen sticking to fences in summer. *Chloris divaricata,* R. Br., the common star grass, is an early quick growing species, which, although its flower stalks may look dry, nevertheless produces a large quantity of leafy feed at bottom. The couch *Cynodon Dactylon, Pers,* which is found following the footsteps of both squatter and farmer must not be overlooked, but being so well known it is needless to do more than just mention it. *Eleusine indica Gærtn* is a strong growing succulent summer fodder in the Brisbane district, but further north it is stated to form a good permanent pasture. The species may be recognised by its deep green color, strong stalks, with star-like panicle the spikelets of which are flat and broad. Equal to the last with regard to summer produce, is *Brown's Paspalum orbiculare,* and it must be reckoned a superior species, for it possesses the advantage of growing through our winter months. This species is mostly met with on rich alluvial flats in company with another fine grass, *Sporobolus indica,* R. Br. The growth of this is rather tufty, somewhat similar to **Poa cæspitosa,* a grass often found with it, but from which it may be readily known by its close spike-like panicle. In similar situations we may often meet with large patches of *Andropogon montanus Roxb.,* a very coarse grass, which does not seem to be much relished by cattle. *Andropogon acicularis,* and *A. contortus, Linn.,* are two good fodder species, but the spear-like seeds of the latter species makes it troublesome to sheepfarmers. Two other grasses are also an annoyance in the same way, *Lappago racemosa Schreber,* by its burr-like seeds; and also the common speargrass, *Streptachne stipoides,* R. Br., although this latter species is one of the best fattening sorts before its seeds are ripe.

As there are a few of our native grasses which stand a deep shade, it may he well to notice them, for although they cannot be recommended as fodder species, yet they have their value for ornamental purposes. Thus under the close shade of our

Casuarina trees, and in the dense scrubs the small grass, *Panicum pygmæum*, R. Br., will be found, forming a soft thick carpet in its natural state. It is not much relished by stock, but if grown on open country it would doubtless prove a valuable species for some lands. In company with the above a much more delicate species will often be seen, perhaps a variety of *P. pygmæum*. Robt. Brown's two species of *Orthopogon*, *O. compositum* and *O. imbecillis*, are great shade lovers, and may be often met with on the sides of hills; the genus will be at once recognised by its straight beard.

The wheat-like *Danthonia*, *D. triticoides Lindley*, and *Sclerachne cyathopoda* of F. von Mueller, two grasses from the north of Queensland, are highly spoken of as fodder species. On the Darling Downs, generally spoken of as the richest pasture lands of the colony, there are a few species of grasses that seem peculiar to the locality. Therefore it will be as well to notice them as Down grasses. The Downs Oat-grass, *Anthistiria avenacea*, of Baron Mueller, is one of the most productive grasses of Australia. Like all other kinds of kangaroo grasses, this produces a large amount of bottom fodder, but it also has the advantage of being a prolific seeder.

The Black or Brown-topped grass is next in importance to the Oat. This, Dr. Brown's *Saccharum fulvum* (*Erianthus fulvus*, *Kunth*), is a sweet grass, of which stock are so fond, that they actually eat it down so close as to cause it to die out.

The Bamboo grass *Stipa ramosissima*, *Sieber*, although a very coarse hard species, is by some highly spoken of as a horse fodder. The larger masses of fine grass, produced at the nodes of the stems, makes this species easy of recognition.

Pennisetum glaucum, R. Br., is a fine fodder grass, and well worthy of cultivation. The same may be said of Baron Mueller's *Panicum cœnicolum*; this species is in appearance very like *Panicum divaricatissimum*, a grass found along the Brisbane River. The White-topped grass, **Danthonia penicillata*, F. v. M., the Umbrella grass, *Aristida ramosa*, R. Br., and *Pappophorum commune*, F. v. M., are three kinds peculiar to the districts, and by some spoken well of, but they seem, from the specimen before me, to be of a rather dry nature. The following grasses have become naturalised in our pastures:—

The well-known Prairie Grass, *Bromus unioloides H.B.* and *Kunth*, is an excellent grass, producing a fine winter fodder, and plenty of seed. The Guinea grass, *Panicum maximum*, Jacq., a most valuable fodder, stands cutting well. The Buffalo grass, *Stenotaphrum Americanum*, Schrad. This is a very fine and desirable species, and cannot be too highly spoken of;

besides being a fine pasture grass, it is also valuable for holding together loose banks of rivers and creeks. To these may be added *Poa annua* and *Poa pratensis*, with also the pretty little *Briza minor*. As it is in the winter months, say June and July, that the pasture is at its worst in Queensland, I shall next notice a few of the best species at that season.

The introduced Prairie Grass, *Bromus unioloides*, keeps up a good growth until about the end of September. This grass is only found on the rich land along rivers, &c. *Poa annua* will be found pretty generally scattered over our ridges.

The Blady grass, **Imperata arundinacea*, where the old has been burnt off during the summer, produces a large amount of sweet feed. *Paspalum orbiculare*, when close fed, is a most valuable winter grass, but if let to get old cattle refuse it.

The Old Kangaroo grass, *Anthistiria australis*, a fine grass in all seasons, is one of our best winter species.

Helopus annulatus. This grass, like the above, produces all the year round.

Though delicate looking, * *Microlena stipoides* produces a large quantity of feed on our damp hill-sides during winter. And the swamps are also covered at this season with *Leersia hexandra*.

On the rich alluvial soils bordering our rivers, *Sporobolus indicus* and *S. diander*, produce abundant feed.

Andropogon refractus, although a species which does not like cold, yet where there is good shelter, is a good species for forest land, even in winter. The same may be said of *Panicum bicolor*, *P. parviflorum*, *P. marginatum*, and its variety *strictum*, all good forest grasses. *Andropogon falcatus*, a valuable lawn grass, is also a good winter species. Doubtless this list might be extended much further, but enough are noticed to show that even in our worst time the pasture of Queensland is good.

Before closing this paper, it may be well to notice those grasses which seem more susceptible than others to the parasitical fungus *(Ergot)*. The following are the species I have usually noticed infested :—*Sporobolus elongatus*, *T. indicus*, *S. diander*, *Paspalum orbiculare*, and *Leersia hexandra*. I may here notice that one of our common sedges, a small *Fimbristylis*, is at times very bad with an ergoty fungus. May it not be this, which at times poisons sheep, and not the too often condemned flowering shrubs?

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Brisbane, Queensland,
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Note.—The foregoing paper was read by the Rev. J. E. Tenison Woods, who marked thus * the species indigenous to Tasmania.