

**NEW SOUTH WALES:
AUSTRALIAN
GRASSES (WITH
ILLUSTRATIONS), VOL. I**

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New South Wales: Australian grasses (with illustrations), Vol. I by Fred. Turner

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NEW SOUTH WALES.

AUSTRALIAN GRASSES

(WITH ILLUSTRATIONS),

BY

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" ETC., ETC.,

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"A CENSUS OF THE GRASSES OF NEW SOUTH WALES";

"NEW COMMERCIAL CROPS FOR NEW SOUTH WALES" (illustrated); "NOXIOUS WEEDS:
INDIGENOUS AND EXOTIC" (illustrated);

"SUPPOSED POISONOUS PLANTS OF NEW SOUTH WALES" (illustrated); etc.

VOL. I.



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[56.]

PREFACE.

THIS volume of Australian Grasses is published under the authority of the Honorable Sydney Smith, M.P., Minister for Mines and Agriculture, New South Wales.

During recent years I have been often asked by scientists and pastoralists to publish an illustrated and descriptive work on Australian grasses for general information, and in some of the press reviews of my work on the "Indigenous Forage Plants of Australia" (non-grasses), a hope was expressed that at no distant date a similar work on Australian grasses would be forthcoming from the same writer. Through the New South Wales Government I have the opportunity of placing such a work before the public, and I venture to think it will not only be a text-book on the subject but a medium of making Australian grasses and their economic properties better known throughout the world. My descriptions of Australian salsolaccous plants (salt-bushes) have been widely republished in this and in other countries for general information, and there is now a great demand for salt-bush seeds, not only for sowing in places on this continent, where the plants have become scarce, but for sowing in South Africa, India, South Europe, and some of the warmer States of North America.

During the past twenty years I have travelled over thirty thousand miles in New South Wales, Queensland, and Victoria. Some of this time was devoted to botanical excursions. For some time I was inspecting and reporting on the capabilities of Crown lands, and the best way of utilizing them, for the Government of New South Wales, and last, but not least, I have written many special reports on the pastoral areas of this country. A synopsis of three of these reports, on important grazing districts, is embodied in this book. I have also grown in an experimental way upwards of one hundred species of Australian grasses, which, I believe,

cannot be said by any one else in Australia who has written anything about them. It will be gathered from the above that the facilities for acquiring information and making observations have given me the necessary qualifications to write with authority on the subject. Since the experiments already referred to were carried out, the publication of my essay on the "Forage Plants and Grasses of Australia," which I read at the Melbourne University before the Australasian Association for the Advancement of Science, and the publication by the New South Wales Government of my "Census of the Grasses of New South Wales," and of my work on the "Indigenous Forage Plants of Australia," together with figures and descriptions of some Australian grasses, there has certainly been a great amount of interest awakened in the subject, not only in Australian scientists and pastoralists, but in those resident in other countries. Not long since I wrote a voluminous report on the herbage of this country, at the request of the American Consul, for the information of the United States Government.

Many successful pastoralists have told me that they know little or nothing about the economic value of the herbage on their grazing areas until they saw my figures and read my descriptions of it, and are now convinced that the indigenous herbage is better suited to the conditions of the climate than a great many of the exotics which have been introduced and recommended for cultivation in many parts of the country. What are known as English grasses will succeed well enough in those parts of Australia which have a climate and rainfall somewhat similar to those of Northern Europe; but these comprise an exceedingly small area in comparison with the whole of the continent. To sow such grasses on most of the grazing areas in this country would only be courting failure.

It would appear that in the early days of settlement the value of the native forage plants and grasses occupied some attention, and different views were entertained on the subject. Sir Joseph Banks, to whom Australia is so much indebted for its early settlement, and for the development of its vegetable resources, remarks in one of his papers:—"The herbage of the Colony is by no means so well adapted to sheep farming as that of Europe, and therefore the progress of the flocks will be slow." This opinion, however, was

soon controverted, for Captain Waterhouse, in writing to Captain Macarthur in the early part of the century, says:—"That he had kept sheep, and found them do well on the natural pasturage, and he believed that good pasturage would be found for any number of sheep that may be raised. He, therefore, ridiculed the idea of artificial grasses being necessary." The opinions entertained by Captain Waterhouse nearly 100 years ago have been amply verified by subsequent experience.

Those who have done original work to popularise Australian grasses are:—Mr. Walter Hill, late Colonial Botanist of Queensland, and Director of the Brisbane Botanic Gardens, who was, I believe, the first person in Australia to recommend the systematic cultivation of, and carry out experiments with, the indigenous grasses. Mr. F. M. Bailey, F.L.S., and the late Mr. K. T. Staiger, F.L.S., who published electrotypes of some Queensland grasses, with a few notes on their importance in pastures. The late Mr. W. H. Bacchus, who published figures of some Victorian grasses, with notes of his observations of them, and the late Rev. Dr. W. Woolls, F.L.S., who published a paper on the grasses of New South Wales. In none of these illustrations are any anatomical drawings shown.

It would be superfluous in this preface to enter upon the present condition of Australian pastures and pasture plants, for in the introduction, and in the synopsis of three special reports already referred to, this subject is treated in a comprehensive way.

In the present volume I have not only endeavoured to show the habit of growth of each grass that is figured and described—a very important matter from a pastoral and agricultural point of view—but to give full dissectional details of the inflorescence of each species, so that no possible mistake can occur in identifying it. The anatomical drawings are the first that have ever been made of Australian grasses, and I have no doubt that they will be fully appreciated by scientists, students, and others who have a desire to be better acquainted with this important part of the Australian flora. There is both a scientific and a popular description of the economic value of each species that is figured; the etymology of the scientific names is also a feature of the book, it being my desire to make it as popular as possible without in any way taking from

its value as a standard work upon the subject. A glossary of the technical terms used in the description of Australian grasses is also embodied in the book, so that any person can soon become thoroughly acquainted with the subject should he be desirous of so doing.

All the drawings, from which the engravings were taken, were made from herbarium specimens which I have collected, or have had collected, in their native habitats. The anatomical parts have been greatly magnified and drawn with the aid of the *Camera lucida*, so that they can be depended upon as being correct. Those persons who have had experience know the difficulty there is in making accurate botanical drawings from herbarium specimens, and will, I think, agree with me that great credit is due to Mr. E. M. Grosse, the artist, for the careful way in which he has done his part of the work.

To Messrs. F. and C. Bennett, the proprietors of the *Town and Country Journal*, my thanks are due for the excellent engravings which have been prepared at their establishment. The printing and binding have been done at the Government Printing Office, and it affords another proof of the excellence of the work performed at that establishment.

The nomenclature adopted is the same as that used in Bentham's "Flora Australiensis," and I am indebted to that valuable work for the botanical diagnosis of genera and species.

FRED. TURNER.

September, 1895.

INTRODUCTION.

It is an old proverb that says—"comparisons are odious," but I think I will be pardoned if I preface this introduction by quoting the following official figures from Mr. T. A. Coghlan's, "Seven Colonies of Australasia, for 1894," which show at a glance the value of five of the principal products that were raised in Australia during the year 1892:—Wool, £17,855,824; gold, £5,703,064; silver, £2,520,220; coal, £1,605,740; copper, £301,241. These figures clearly indicate from what product the principal wealth of this country is obtained. The number of sheep in Australia in 1892 was estimated at 101,637,179; and the number of cattle in the same year at 11,351,967. The value of the pastoral property was estimated in 1893 at over £200,000,000 (two hundred millions) sterling. If this enormous sum represents the value of the pastoral industry, what must be the value of the indigenous forage plants and grasses which provide food for the millions of animals that are now grazing in this country? I think it may be safely said that very few, even amongst the most experienced pastoralists, ever look at the matter from this point of view, yet it is the most important one. It is the valuable herbage that is growing in this country, though it is not so plentiful and varied in some districts as it used to be, that has made Australia noted throughout the world for its rich pasturage. Shrewd business men have been often heard to make the remark, "What would Australia do without its wool?" but very few persons, however, ever pause to think what Australia would do without the indigenous herbage, which is really the principal factor in creating this valuable product. It is also often remarked, that the Australian climate is peculiarly favourable for the production of high class wool. Admitted that this may have some influence, thoughtful persons cannot close their eyes to the fact that good pasture is a more essential factor.

Considering that the prosperity of the people on this continent greatly depends, and will do so for many years to come, upon the quantity and also the quality of the wool, beef, mutton, butter, tallow, hides, &c., that are raised here, both for home consumption and for export; it has been a subject for remark that so little practical information, with the exception of my own publications, about the comparative merits of the different species of forage-plants and grasses that are indigenous to this country has been disseminated. Many successful pastoralists and dairymen have admitted to me that they knew very little about the forage-plants and grasses in their districts until they saw my figures and read my descriptions of them.

As a means of giving reliable information to the rising generation, the comparative merits of the indigenous forage-plants and grasses, indeed the vegetation in general, might form a part of the curriculum of the national education. If there were placed in all country State schools an enlarged drawing of each valuable species of forage-plant and grass, that is peculiar to the district in which the school was situated, with its botanical and common name, together with a short popular description, and if possible analysis, it might make a lasting impression upon the young mind, and would, most probably, lead to valuable results in after years.

As long as a greater portion of this continent is devoted to depasturing sheep and cattle and Australia intends to hold her own against the world in the production of high-class wool, also in the matter of the frozen meat export trade, it becomes of vital importance to the population that more attention should be paid to the native forage plants and grasses than has hitherto been the case and that some of them should be saved from extermination by a proper system of conservation and even cultivation. There is no gainsaying the fact that during the past twenty years or so large tracts of country in the interior have been so overstocked and overrun with rabbits and many valuable pasture plants have become so scarce that it would take some years of careful conservation to bring many of them back to anything like their original state. Being so closely fed down and often trampled under foot the plants have little chance to recuperate, and their only natural means of reproduction—namely, by seed—is also partially destroyed, and every decade under present conditions will make matters worse. Moreover, the paddocks being so constantly trampled upon are sometimes as hard as the roads throughout the country. Under these circumstances it can hardly be wondered at that some of the native grasses often present a harsh appearance, and if it were not for the sharp points on many of their seeds some of them would probably have been extinct long ago. These sharp-pointed seeds naturally penetrate the earth and when rain falls to soften it they germinate, and so the grasses are perpetuated in a sort of way. An occasionally good season may to a slight extent remedy this, but observant and thoughtful persons can see that in the near future more vigorous action will have to be taken to keep the pastures up to something like their pristine condition or the number of sheep and cattle will have to be considerably lessened, which of course means the production of less marketable produce. It should also be borne in mind that every fleece of wool which is produced takes a certain amount of potash and other fertile substances out of the earth, and very little so far has been done to restore these elements to the soil, except the little that is returned in a natural way.

Overstocking and the rabbit pest on certain pastoral areas in the interior of this country have already had an injurious effect upon some of the natural herbage. On such areas some of the more valuable plants have been so persistently eaten down that they are gradually dying out. Nor is this all, for many noxious weeds, both indigenous and exotic, bad grasses, and pine scrub are gradually occupying their place. So plentiful, indeed, have some of these pests become that laws have been directed towards their extermination. In certain parts of the interior the native "spear," "corkscrew," "wire," and "three-awned spear" grasses, and also the "burr" weeds are increasing. It is easy to account for the ever-widening area of their occupation, because when old they are seldom or never eaten and are allowed to seed at their own sweet will. The ground in many places being bare of more nutritious herbage, the seeds of these noxious plants germinate readily under ordinary conditions, and soon take possession of any unoccupied land. Their dissemination in many parts of the country may be accounted for by the fact that sheep and other animals will carry the "burrs" and "spear-grass seeds" in their wool and often deposit them miles from the plants that bore them. I have recorded and published the names of over 200 exotic weeds that have become acclimatised in this country. All these, of course, have not a prejudicial effect on wool or on the health of stock, therefore I shall only list a few of the really bad ones. Should any persons be desirous of consulting my published list of exotic weeds I would refer them to the *Agricultural Gazette* of New South Wales for 1890, vol. I, page 303.