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VICTORIA.

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REPORT

OF THE

GOVERNMENT BOTANIST

FOR THE

YEAR ENDING 30TH JUNE 1874.

PRESENTED TO BOTH HOUSES OF PARLIAMENT BY HIS EXCELLENCY'S COMMAND.

By Authority:

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REPORT.

The Honorable Robert Ramsay, &c., &c., &c.

Melbourne, August 1874.

SIR,

In compliance with your communication of the 6th instant, I have now the honor of submitting to you a record of the progress of my departmental labors during the last financial year. Though like in all former years of my administration, so also in this, my time, far beyond the ordinary office hours, allotted to official engagements, has been given to the public service, yet with all unabating efforts I have been compelled to draw the line of my operations during the last twelve months into far more narrow limits than I could have wished for the current requirements and for the anticipated necessities of my departmental obligations. Such labors as still could be carried out may be classed as—

- (1.) The routine work of the office, with its daily calls for information, either orally or in correspondence.
- (2.) The phytographic engagements for descriptive works.
- (3.) The industrial researches in connection with indigenous and foreign plants.
- (4.) The travels for the continuation of the field-studies, concerning the Victorian vegetation.
- (5.) The issue of educational collections.

In referring successively to these series of engagements I shall consider it my duty to explain also the future requirements of each; and I shall simultaneously place before you statements on those branches of the service which, after the temporary withdrawal of most of the working votes of the department, and also of nearly all the buildings, came to a standstill. I shall do this with all the more freedom as it is expected, that in a professional department, of which, in this instance, I am the founder, the head of the establishment is to afford to the honorable the Ministerial chief every advice; and inasmuch as my institution was encouraged for many years by enlightened legislative approval, I do entertain the hope, that my explanations will lead to such a reorganization of my department as will enable me to do, honorably, justice to the branch of public service entrusted to my responsible care.

The routine work then of the department from the 1st of July 1873 till the 30th June 1874 consisted of issuing about 2,000 letters, or communications equivalent to letters, irrespective of such collateral correspondence as may not be strictly official, like that on geographic exploration, but which, nevertheless, remains intimately connected with my researches on Australian plants, and which largely tends to add to our collections and other means of phytologic study. That the ordinary correspondence should be so extensive cannot be surprising when it is considered that the vegetation merely of Australia consists of about 11,000 species of plants (the minutest fungi, Desmidiaceæ and Diatomæ uncounted), that not only on any of these the most varied enquiry arises, but that in like manner information is also expected at any time on any extra-Australian plants, numbering already about 120,000 species (their varieties not even considered). It is also easily understood how increasing demand here for information manifests itself on these almost numberless indigenous and foreign plants, all of which, in the great household of nature, have their assigned uses, though as yet their value may be largely buried in obscurity, and can be rendered only more fully known by the progressive strides of science. But, with the augmented calls for information arising in an increasing community, enlarged means for extended research and wider diffusion of knowledge become needful. It is almost unnecessary to add that, so far as the absence of any kind of office accommodation admitted of it, daily advice and explanations have been afforded.

To the second category of the service belongs the issue (during the year) of the sixth volume of the *Flora of Australia*, in the elaboration of which I am engaged with Mr. Bentham in London, who is the principal author of the work, but whose

main material is obtained from our museum collections and from the notes which accompany them. These collections were commenced by me in Australia already in 1847, and their augmentation has continued uninterruptedly ever since. The supply of copies of the new volume alluded to has been duly received from the Agent-General so far as the Victorian Government is entitled, and a number of the copies have been distributed to public institutions. During the year my own preliminary labors for the seventh volume have been continued, comprising connected researches on the Grasses of Australia, of which we possess, according to our collections, about 250 species; further, on Rushes, Sedges and allied plants (the difficult order of Restiaceæ, numbering alone about 70 species), on Najadeæ and cognate groups, on Palms and various other monocotyledonous plants, the Cyperaceæ alone remaining yet to be finally examined here for the seventh volume, since the Liliaceæ and cognate plants, as well as all the Ferns, have undergone already previously my local scrutiny. The vast material accumulated under my hands for arrangement has enabled me to assign to numerous genera, species and varieties now at last a settled systematic position, involving unavoidable and extensive changes in previous appellations, as reference to my recent writings on grasses and some other orders of plants will amply testify. Nor should be lost sight of the fact, in estimating the task involved, that the grasses of Victoria, or indeed any other of our plants, could only be systematically elaborated in conjunction with those of any other part of Australia, and that again the Australian species, as a whole, could not be properly and permanently defined except in comparison with those of all other parts of the globe. Most likely the seventh volume of the *Australian Flora* will appear in 1875; but it requires to be followed by a supplemental volume on the cotyledonar plants, for which my manuscripts and notes are largely prepared; then, subsequently, will also be due two volumes on Mosses, Lichens, Algæ and Fungi, for the elaboration of which, however, even the continued sacrifice of a considerable share of my yearly official income would not provide all the needful books, journals and instruments.

It fell also to my share during the year to furnish a botanical appendix to the creditable works of Mr. F. A. Campbell, of Geelong, on the New Hebrides and Loyalty Islands, from collections there formed on my suggestions, by the author, during his visit to those groups. By such means we have obtained the first connected records of the insular vegetation of those spots of the globe, after the lapse of more than a century since their discovery. Such opportunities for research should also be seized on by other travellers, and especially by educated settlers residing on these islands, as thereby will be gained not merely an advancement for phytographic science, but also a closer acquaintance with the natural productions of any of the Pacific insular lands, to the advantage also of Australian industries and commerce.

For the department of Mines, from material considerably placed at my disposal by R. Brough Smyth, Esq., have been furnished some additional contributions towards Victorian vegetable palæontology, by which further became known the vegetation of our pliocene period, remarkable for its densely umbrageous trees of almost tropical types, which, as very recently ascertained, spread over very extensive areas, where in the present creation nothing of the past physiognomic grandeur of the vegetation is left. The eighth volume of the *Fragmenta Phytographiæ Australiæ* has so far advanced as to render its conclusion by the end of 1874 possible. As originally designed, this work has been reserved for the promulgation of absolutely new observations. To render these accessible to all nations alike, an ancient language, taught at every grammar school, is chosen for its construction. With an extraordinary injustice it has been repeatedly and pointedly made to appear on public occasions, as if this was the only language adopted for my scientific writings; whereas all my other works are written in the English, and not in any other language ever since I am in Australia. The new volume of the *Fragmenta* can, however, not be illustrated in the manner of most of the former ones, unless a special sum is anew provided for lithographic and xylographic plates, illustrative to my various works; with any intentions for fair progress such would engage almost exclusively the time of an artist. Thus since four years or more the lithograms of the Victorian plants, which as yet have only been carried from the Thalamifloræ to the Monochlamydeæ, could not be continued; nor could the necessary 150 small woodcuts for a flora of Victoria be prepared, nor special illustrations be furnished of the Grasses and Eucalypts, with extensive analytic details, although all this was so long intended, and would signally promote scientific application to industrial and pastoral pursuits.

Before leaving this subject it is in bare justice but right to acknowledge the uniform readiness and urbanity, experienced through very many years from Mr. Ferris, the Government Printer, in passing my works through the press, so far as this could be done without any special vote from the Legislature; likewise is it my pleasing duty to bestow every praise on the correct excellence of the print, the composition of which requiring classical knowledge. It is my intention, with your approval, to issue in 1875 "a census of Australian plants" for easy reference to Museum collections, to technologic objects from native vegetable resources, to any Australian garden-plants, or indeed to any other native phytologic object requiring scientific classification.

Proceeding next to a record of my industrial researches through the year, I wish respectfully to draw your attention to a chapter in the new volume of our Acclimatization Society giving "additions to the lists of the principal timber trees and other select plants readily eligible for Victorian industrial culture," by which publication my previous notes on 300 species of the more important timber trees, and on 700 other plants of prominent value, became supplemented to the extent of about 370 species, while cursorily allusion is made to many more. It may be worthy of your consideration, whether it would be desirable to reissue these three lists in a connected form with such augmentations as already I can offer; for although the Acclimatization Society distributed a large number of copies, besides several hundreds printed and distributed on my private expense—all done with a view of diffusing information on many rural industries—yet the supply proved to fall far short of demand. It would, however, be desirable that, for all such prints of considerable extent, in just fairness to every branch of the Government service, special votes should be provided, as is already the case in several other departments. I can also place unreservedly at the disposal of the Government a translation, prepared in the course of the last few years as a bye-work, of Dr. Wittstein's meritorious volume on Chemical Analyses of Plants and their Products, the translation into the English language having been granted to myself by the illustrious author. But the withdrawal of my laboratory and its apparatus and instruments from me, and the discontinuation of the modest former fund for employing an operator, and obtaining the necessary chemicals and other requisites, have brought all my active laboratory researches to a close. Their bearing on our yet largely latent resources and industries may, however, be demonstrated by the fact, that at the London Industrial Exhibition, during this year, one of the highest rewards was bestowed on the very last products and educts, sent from my laboratory. Entirely novel in this rather extensive series of exhibits were, on this occasion, the samples of tar-oils from *Eucalyptus globulus*, all distinct in their specific gravity, boiling-point, color, solvent power, odor and other physical properties. The percentage of tar (all of more or less distinct characters) obtainable from a series of various Victorian woods is given in a table annexed to this report, so also the proportionate yield of medicinal aloe from several species of *Aloe*; saponin from the root and bark of *Acacia lophantha* and *A. decurrens*; caoutchouc from *Ficus macrophylla*; potash from *Eucalyptus* and Fern-tree ashes; tannic acid from the catechu of *Acacia decurrens*. These experiments, as arranged by me, were conducted by Mr. L. Rummel.

An index of the articles sent from my laboratory to the London Exhibition, is appended to this document. Among the exhibits pure alcohol from the sawdust of *Eucalyptus* wood (from which also paper-paste and oxalic acid, together with other products, may be obtained) attracted much attention in the home-country.

Many other experiments were carried on during the latter time of my possessing the means for some laboratory work. Thus, the acids of our *Casuarinas* (in this instance of *C. quadrivalvis*) were subjected to analysis, and the presence of citric acid, accompanied by two other organic acids, was shown in the foliage of these trees. As usual, numerous investigations of these kinds gave negative results. The percentage of the volatile oil in the foliage of *Melaleuca hypericifolia*, *M. decussata*, *Callistemon rigidus*, *C. rugulosus*, *Agonis flexuosa*, *Eucalyptus cornuta*, *E. colossea*, *E. populnea*, *E. calophylla*, *E. nutans*, though known to be small, was also ascertained, while I was commencing to study the physical and technological properties of each. For all these purposes the control over the Botanic Garden at the time, and the utilization of its industrial plants, afforded then additional facilities for such kinds of researches.

As further experiments on new substances may be adduced, those on the dye principles of three species of native *Droseras* or Sundew herbs; also the results

attained by experiments on rabbits, that *Burchardia umbellata* and *Anguillaria australis*, although belonging to the melanthaceans and therefore partly poisonous tribe of *Liliaceæ*, contain no noxious principles in their tuberous roots. In the search for salep in the tubers of our terrestrial *Orchideæ* the common *Microtis porrifolia* gave the best, indeed highly satisfactory, results. In drying, the roots of this species evolve a slight violet odor, and ten grains of the dry powder produces one ounce of good pale mucilage, free of bitterness. The tubers of *Thelymitra aristata*, although still richer in mucilage, are slightly bitter and of brownish tinge. As yet, but few of the numerous *Orchids* of *Victoria* are examined in this respect, as these tests came to a perfect close; but the few kinds of *Pterostylis* tubers experimented on proved inferior to those of *Microtis*.

Among the articles sent to the last London Exhibition, the *Eucalyptus* tars, also potash from the *Eucalypts*, various fibres, including those of some common rushes and grasses, the material for superior paper to supplement the supply of rags and sparta, and many other native products, will be early destined to add to our exports, as already explained years ago in my lectures on forest industries, objects of botanic gardens and application of phytology to the practical purposes of life; which lectures are perhaps deserving, for promotion of new rural engagements, to reappear in a new edition. The value of the cajeput-oil of our *Eucalypts* and allied trees was explained in my first report to the Legislative Council of this colony as far back as 1853 (at page 6), in which document already many other of our future resources were distinctly indicated or foreshadowed amidst the agitations of the earliest gold times.

The persevering ingenuity and the intelligent application of capital of one gentleman, Joseph Bosisto, Esq., of Richmond, have raised the production of various kinds of *Eucalyptus* oil to a flourishing industry, though in first instance indicated or called forth by the labors of my own department. So we have other mercantile commodities, the value of which I foresaw, and the recognition of which, here and abroad, I always aided, not only by departmental but also unofficial efforts. Thus it was in the Botanic Garden of Melbourne, and there only, where Mons. Ramel became, twenty years ago, first acquainted with the *Eucalyptus globulus*, and where this enlightened and patriotic gentleman could recognise its celerity of growth and its resistance to dry heat, the quality of its timber being then already known. Hence arose, for many years under almost my sole aid, M. Ramel's introduction of this tree and several other *Eucalypts* to South France and Algeria, while by unceasing efforts on my part, under much discouragement and adversity, I endeavoured to do my public duty also in this direction towards my adopted country, by finding for the *Eucalypts*, first of all in numerous species (140 now being known, irrespective of what may exist in Eastern New Guinea), a place in many countries of both hemispheres. The medicinal experiments, especially as regards the value of these trees, through therapeutic and climatic action, in intermittent fevers, their antiseptic properties and other qualities for hygienic purposes, were instituted in fever regions of various parts of South Europe and South America, of which we are happily almost free; and this mainly on material from trees, for the early introduction of which into these countries I was instrumental myself while performing the duties of my office, or while promoting scientific research out of private and but slender means. Exertions like these have much brought about the extensive exports of *Eucalyptus* seeds, increasing from year to year, to any places of the world free of severe frosts and free of intense damp heat; the way for this, like in other instances, was paved by extensive correspondence in several languages, by manifold literary writings, by active co-operation in exhibitions, ever since 1854, by interchanges for test culture, by oral explanations of almost daily occurrence, and finally by unsparing application of any private resources of my own. In the benefits, which hence have arisen to us here, also the surrounding colonies have long since participated. Our Industrial City-Museum contains samples of many technologic products furnished by my department, such as new and various paper material, fibres, fixed and distilled oils, native potash, soda, dyes, tars, acetic wood acid, wood alcohol, bromine, iodine and many other substances from native material, still lying latent, though extant in boundless quantity; yet, as may be imagined, all these exhibit only very fragmentary the resources of our indigenous vegetable wealth, not to speak of the commercial and industrial articles which can be obtained, either by direct yield or by the application of chemical or industrial processes, from the almost endless number of foreign plants calculated to prosper under the Australian sky. In order, therefore,

to enable me to resume my labors also in this direction, I would respectfully recommend, as one of the needful measures, that my laboratory, with all its appliances, together with its former modest working vote, be restored to my use, and that the simple analyses of soil, lately—so I understand—performed there, may be carried out at a convenient closeness to the department, to which this particular branch of the public service belongs, and in a special structure for that purpose, which need not be expensive.

Turning now to the field services during the year, it is incumbent on me to allude, at least briefly, to the various journeys performed by myself, such as they have been, without the needful votes, either for any field collector or for the requirements of the head of the department.

From the 11th to the 17th December I was engaged in various observations on the plants in the forest regions of the Upper Yarra and the southern branches of the Goulburn River, adding to my definitions and localities of the plants of Victoria, and obtaining some species of leading interest for the "educational collections." In these sylvan tracts I also instituted various measurements of the heights of *Eucalyptus amygdalina* (var. *regnans*), so far as my brief stay admitted, the greatest heights obtained being approximately 400 feet. To some apparently higher trees I could not obtain access during my short stay and with the means at my command, as the dense jungle would require to be cleared for a base line. It is my intention to resume these investigations at an early date, with the prospect of renewed support in the commenced new financial year. The magnificent *Festuca dives*, discovered by me in West Gippsland during my travels in 1860, was now ascertained to have a wide range through the forests towards the Yarra and Goulburn sources, where, among grasses, it forms a most stately object, the height of twelve feet being not unusual, while occasionally this superb grass in the fern-tree gullies, on rivulets, attains in rich soil to seventeen feet. Among grasses, fit to live under the shade of trees, it becomes for humid localities one of the most eligible; for although the broad foliage is somewhat coarse, yet the panicle of seeds is very ample and nutritious. This *Festuca* is one of the most desirable for scenic group planting in horticulture. Mr. C. Walter, to whose disinterested zeal the field service of my institution owes so much, was in this short journey part of the time my companion. The completion of the railway line to Wodonga afforded an easy opportunity for approach to the Hume River district, which was left by me untraversed, when in 1854 I forced, as a pioneer, my way through the whole length of the Mitta-mitta country (then ascending, naming, and measuring Mount Hotham and other alpine heights), and when in 1855 I approached and traversed our north-eastern high alps from the Snowy River. With the utterly reduced means of my department this new journey through a large, and by me hitherto entirely unexplored district, could not have been carried out even in its hurried course, had it not been for the generosity of the settlers on the line of my travels, among whom I should especially mention James Findlay, Esq., of Towang, and Sydney Watson, Esq., of Walwa, as deserving prominent recognition for the aid afforded to this enterprise. The lagoons and other waters of the Hume system afforded, at even a hasty inspection, on but a few places, many rare water plants, among which the *Brasenia* was particularly conspicuous. Many plants, new to Victoria, and a few new to science, recorded among those in the appended list, were obtained from the watercourses and the high romantic granite mountains of the extra-alpine regions, and additional observations were instituted for my descriptive volume on the highland and partly glacier vegetation, large masses of icy snow existing in January on the gentle eastern terminal slopes of the ranges, while on the abrupt western faces the glaciers had just only melted before the summer sun.

To tourists, who may desire to spend some time in the fresh, cool and bracing alpine air, away from the midsummer heat of our lowlands, the ascent of the alps along the Hume River is best accomplished from the eastern side, whence the more gradual slopes render the access of horses comparatively easy; while, however, the banks of the river are stretching on many places to the western base of the snowy mountains, from whence starting points are obtainable for pedestrian ascents from lovely camps at the very foot of the bold and grand chain of ranges. Once mounted, the summits of the alps are traversable for many miles without much impediment, the whole terminal portions, from 6,000 to 7,000 feet elevation, being above the region of trees and even shrubs, open therefore in all directions; while a second spring can be enjoyed by the visitor here long after the spring flowers of the lowlands have passed

*Festuca
dives*

away. The variety of the plants, peculiar to these alpine heights is most charming, about one hundred species being restricted to elevations, on which snow falls during the greater part of the year.

It would lead too far to enter in this document on any details of the vegetation of the Hume River country, as, moreover, the special phytographic observations find best their place in the works specially designed for the purpose. But I would wish to allude here to an important horticultural acquisition, which emanated from this journey, namely, a crimson variety of the almost arborescent *Correa Lawrenciana* of Sir William Hooker, which variety was never seen before, combining all the brilliancy of the flowers of *C. speciosa* with a hardy endurance to a cold climate, with very tall and stately growth, and with a shining lustre of large leaves. An entirely new tree, probably of medicinal value, the *Bertya Findlayi*, was also discovered; while several *Eucalypts* of New South Wales were noticed, which seem not to occur in other parts of our colony. The Tasmanian sassafras tree, pepper tree and bluegum tree, with many other southern forms of vegetation, were traced for the first time so far north, and really into the territory of New South Wales. The elevations to which numerous lowland plants ascend into the snowy ranges was also determined on this occasion. An Italian, Casparo Mussio, who accompanied me through Mr. Findlay's kindness, and was familiar with many parts of these alps, proved an able companion. To do, however, justice to the task of examining the vegetation of so wide a tract of country closely—most parts of which as yet uninhabited and naturally of difficult access—it would be needful to devote many months specially for the purpose of penetrating through many of the mountain recesses, and of watching the numerous different plants throughout the season. cursorily as this first journey necessarily was, which occupied my time from the 6th to the 26th January, it leaves, at all events, the vegetation of the Hume River district no longer unrepresented in our collections.

From the 18th till the 25th of February I went to the country about Mount Gellibrand, Mount Emu, Mount Elephant and to many interjacent localities, on which I did not touch, when proceeding on a more southern route to the Grampians and adjoining ranges in 1853. In these new travels I enjoyed every consideration and local support from Sam. Wilson, Esq., the Hon. Philip Russell, M.L.C., and Alex. Wilson, Esq. Irrespective of further tracing the geographic limits of many rare plants of the Western districts, I proved here the existence of the genus *Wolffia*, of the occurrence of which in any part of Australia we were not previously aware. From the 26th of February till the 10th of March I proceeded through the ranges and heaths west of Cape Otway, the whole of the country in that direction having been beyond my reach, when, in 1857, the dense forests towards Apollo Bay and thence to Cape Otway came within the scope of my phytologic explorations. The very tall but extremely slender tree fern, *Cyathea medullaris*, first found by Mr. Wilkinson during his partial geologic survey of these regions, seems not to extend so far west as my journey through the coast tracts carried me; but several other ferns of great rarity were observed in the deep, dark and ever humid glens, and the areal extent of many species of plants, the changes of their varieties, and their relation to geological and climatic conditions was traced to the rivers Curdie and Gellibrand. In this part of my recent travels I experienced most liberal aid from Dr. Curdie, M.A., J.P., of Tondarook, and from Messrs. Oliver of the Gellibrand River. An important work, in which the department has shared during the year, consists in the elucidation of the plants of Lord Howe's Island, largely accessible to us through the disinterested stay of Mr. Fullagar (accompanied by Mr. Lind) for nearly a year on this very isolated and phyto-geographically highly remarkable oceanic spot. I have not deemed it necessary to occupy in this already somewhat extended Report any space with references to amateur contributors who enriched our collections, as the names of finders of any rare or new plants, which may become at any time accessible to me, are recorded with scrupulous conscientiousness in the pages of my descriptive works.

Lastly, it remains for me to refer to the issue of the educational collections as an additional engagement initiated in the departmental service. I had long in contemplation to arouse a more general and popular interest in the native vegetation surrounding us by choosing some means, for instilling the very first instructions, more inviting than the use of text-books, and more fascinating than scholastic lectures. Though my aims were also—and not unsuccessfully so—in this direction,

by securing and arranging methodically the plants in growth at the Botanic Gardens until that work became impaired, and finally impeded, if not even largely destroyed; yet I felt that an impetus should be given to the study, especially of native plants, at any place also far beyond the reach of gardens of instruction, and to any one, who might hesitate to address me in correspondence, however cheerfully I have named plants, and explained their scientific and utilitarian bearings almost daily during these twenty years and more. To lead, therefore, by some more direct and universal action the attention of the now numerous inhabitants of our colony to a more scientific contemplation of the plants which, in our winterless zone, present themselves successively throughout the year to our views, I required to furnish starting points on many places for local studies. This design I hoped most pleasingly and lastingly to attain by commencing the "educational collections," to be located in the rooms of such public institutions as during the ordinary hours of recreation and leisure are accessible. Each fascicle is to contain fifty species of natural specimens, in a pressed and dried state, and is to exhibit as many representative forms of genera and orders as conveniently at any particular period of issue can be gathered, and each species is to be accompanied by annotations on its scientific name, its English appellation (if such in rare instances exists), its geographic limits, and some of its literature. By adopting such a plan I could bring a number of typical forms of plants for independent identification or comparison of the plants of any district before the views of local observers, who could not fail to recognise from the indications thus offered, at once, a multitude of plants, whether specifically or generically, at the very vicinity of their habitations. The first fascicle now contains representations of fifty genera, and nearly as many natural orders. The present edition, for mere want of financial support to my department, was limited to 100 copies, involving nevertheless the drying of about 10,000 specimens, inasmuch as each species had to be exhibited not only in flower, but in fruit also. This edition can be extended according to the means available, at any season for collecting and drying purposes, and for obtaining the necessary paper and board-covers. On the extent of these means must also depend the more or less rapid or tardy issue of subsequent fascicles. The two assistants of the department, Mr. G. Luehmann and Mr. C. Groener, deserve praise for having given up much of their time on holidays, and at early and late hours, to obtain and prepare a large share of the plants for the 100 copies of this first fascicle. In the embarrassed state of the department, also, this work had to be carried on under great disadvantage, because not even a single packing or drying room is left me, the only building space remaining at my disposal for the whole departmental work in every branch being the Museum room, which is overcrowded by the normal collections, and to which no building additions have been made during the last sixteen years, notwithstanding repeated solicitations.

Thus the process of drying plants for any of our departmental purposes has to be carried out in the Museum room itself, while thereby the safety of the normal collection became and still becomes endangered through the invasion of insects from freshly gathered plants. The irreparable injury, to which thus the Museum plants are exposed, may at any time befall not only plants gathered since the last thirty-five years by myself, but also specimens even from still remoter times, which out of the hands of celebrated authors and travellers passed early into my care. A valuable chemical auxiliary for maintaining our Museum plants in preservation we have found in the bisulphid of carbon, applied according to M. Lénormand's method, as recommended in the *Bulletin de la Société Botanique de France*, 1858. In connection with this subject, it remains for me yet to bring under your favorable notice, that although the collections of Australian plants in our Museum are by far the largest in the world, yet the extra-Australian section of the Museum should be widely extended. To attain this object speedily and advantageously a double measure is recommendable: First, the maintenance (as in former years) of a field collector in localities yet rich in new plants, with a view of affording us not solely some direct additions to our own Museum treasures, but, furthermore, also the means for interchanges, without which no continuous access to plants of value and novelty can be obtained from institutions of kindred tendency abroad; nor could we keep pace with them in our own progressive study. The second measure would be to secure by purchase an extensive collection of extra-Australian museum plants, rich in authentic specimens of those writers, who issued their phytographic works in the earlier parts of this century, in order to enable us here, for all times, to institute independent critical comparison, and to give us the

best of basis to work on for the identification and classification of any plant of the globe. The acquisition of such a collection would long since have been realized out of my private resources, had they not been absorbed in the struggle through years of maintaining a department, created by myself, in its lasting efficiency and scientific dignity; while the addition of large extra-Australian collections of authoritative importance to the great treasures here already accumulated would render our phytologic Museum one of the most important of the globe, and would confer benefits and facilities on the scientific service of this colony for all future generations.

I have the honor, Sir, to be

Your obedient servant,

FERD. VON MUELLER.

A suggestion of mine, made to the Board of Education in 1872, and on which could not be acted while the changes in the school system of the country were contemplated, may now be deserving of consideration. It was to this effect, that at each school an annual prize should be held out for the best contribution to a collection of dried native plants at each school. The requisite scientific information I offered to afford, if a numbered duplicate set of any such plants were sent to my office.

APPENDIX.

ANA
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COPY 1

SEVENTH SYSTEMATIC INDEX OF THE PLANTS INDIGENOUS TO THE COLONY OF VICTORIA.

DICOTYLEDONEÆ.

Ranunculaceæ.

Ranunculus Muelleri, Benth.

Cruciferae.

Menkea australis, Lehmann.
Geococcus pusillus, Drumm. & Harv.
Malcolmia Afriana, R. Brown.
Cakile maritima, Scopoli.
Lepidium foliosum, Desvaux.

Rhamnaceæ.

Pomaderris phillyroides, Sieber.

Euphorbiaceæ.

Bertya Findlayi, F. v. M.

Stackhousiaceæ.

Stackhousia viminalis, Smith.

Haloragæ.

Myriophyllum amphibium, Labill.
verrucosum, Lindl.
Muelleri, Sonder.

Leguminosæ.

* *Vicia hirsuta*, Koch.

Myrtaceæ.

Homoranthus virgatus, Cunningham.

Saxifrageæ.

Eucryphia Moorci, F. v. M.

Umbelliferae.

Apium leptophyllum, F. v. M.
Actinotus Helianthi, Labill.

Compositæ.

Centipeda thespedioides, F. v. M.
* *Sonchus maritimus*, Linné.
* *Crepis virens*, Villars.
* *Pieris echioides*, Linné.

Lobeliaceæ.

Lobelia rhombifolia, Vriese.

Polemoniaceæ.

* *Navarretia involucrata*, Ruiz et Paron.

Labiatae.

Westringia cremicola, Cunningham.
Prostanthera Walteri, F. v. M.
debilis, F. v. M.

Lentibularinæ.

Utricularia lateriflora, R. Brown.

Plantagineæ.

Plantago Gunnii, J. Hooker.

Salsolaceæ.

Atriplex crystallinum, J. Hooker.

Proteaceæ.

Grevillea ramosissima, Meissner.

MONOCOTYLEDONEÆ.

Orchideæ.

Pterostylis semirubra, F. v. M.

Liliaceæ.

Schelhammera undulata, R. Brown.

Eriocaulæ.

Eriocaulon Smithii, R. Brown.

Gramineæ.

Sporobolus pulchellus, R. Brown.
elongatus, R. Brown.
Aristida vagans, Cavanilles.
Triraphis mollis, R. Brown.
Elythrophora articulata, Beauvois.
Eriochloa punctata, Hamilton.
Panicum Brownii, Roem. et Schult.
divaricatissimum, R. Brown.
* *sanguinale*, Linné.
* *Crus galli*, Linné.
Festuca dives, F. v. M.
Fordeana, F. v. M.
fusca, Linné.
Poa lepida, F. v. M.
Hierochloa rariflora, J. Hooker.
Andropogon annulatus, Forskœl.
refraetus, R. Brown.
montanus, Roxburgh.
Ehrharta distichophylla, Labillardière.

Cyperaceæ.

Cyperus unioides, R. Brown.
Uncinia riparia, R. Brown.
Carex striata, R. Brown.

Lemnaceæ.

Lemna oligorrhiza, Kurz.
polyrrhiza, Linné.
Wolffia Micheli, Schleiden.

Najadeæ.

Potamogeton compressus, Linné.
erispus, Linné.

ACOTYLEDONEÆ.

Filices.

Cyathea medullaris, Swartz.
Dieksonia davallioides, R. Brown.
Davallia pyxidata, Smith.
Asplenium Nidus, Linné.
Aspidium molle, Swartz.
hispidum, Swartz.
Polypodium membranifolium, R. Brown.
Pteris comans, G. Forster.

Fungi.

(By the Rev. M. I. Berkeley, M.A.)

Agaricus excoriatus, Fries.
tuborigena, Berkeley.
lumigans, F. v. M.

- Agaricus candescens, F. v. M.
 scabriusculus, Berkeley.
 caryophyllus, Berkeley.
 pudicus, Fries.
 tener, Schaeffer.
 globigera, Berkeley.
 campestris, Linné.
 semiglobatus, Batsch.
 papilionaceus, Bulliard.
 Bolbitius titubans, Fries.
 Hygrophorus ceraceus, Fries.
 nigricaus, Berkeley.
 Marasmius hamatocephalus, Montagne.
 ferrugineus, Berkeley.
 Panus coriaceus, Berkeley.
 Boletus ananæceps, Berkeley.
 Polyporus australis, Fries.
 scruposus, Fries.
 Phlebia reflexa, Berkeley.
 Thelephora dendritica, Fries.
 congesta, Berkeley.
 luteo-cincta, Berkeley.
 exsculpta, Berkeley.
 Stercum elegans, Fries.
 papyraceum, Montagne.
 Corticium Auberianum, Montagne.
 Clavaria abietina, Schumacher.
 lorithamnus, Berkeley.
 rugosa, Bulliard.
- Tremella mesenterica, Retzius.
 Hirneola hispidula, Berkeley.
 Guepinia peziziformis, Berkeley.
 Laschia micropus, Berkeley.
 Geaster Drummondi, Berkeley.
 Xylopodium Australe, Berkeley.
 Scleroderma Geaster, Fries.
 Bovista, Fries.
 vulgare, Fries.
 Aseroc rubra, La Billardière.
 Neodictyon gracile, Berkeley.
 Puccinia malvacearum, Montagne.
 Lecythea lini, Léveillé.
 Æcidium microstomum, Berkeley.
 Røstelia polita, Berkeley.
 Ustilago carbo, Tulasne.
 Isaria graminiperda, Berk. & Muell.
 Rhinotrichum pulchrum, Berkeley.
 Cladosporium herbarum, Link.
 Geoglossum hirsutum, Persoon.
 glabrum, Persoon.
 Peziza cochleata, Hudsou.
 repanda, Wahlenberg.
 hirneoloides, Berkeley.
 Adamsoni, Berkeley.
 Cordyceps Gunnii, Berkeley.
 entomorrhiza, Fries.
 Xylaria ectogramma, Berkeley.
 phosphorea, Berkeley.

ADDITIONS TO THE GENERA OF PLANTS OF AUSTRALIA SINCE THE ISSUE OF
THE LAST REPORT.

- Malcolmia, R. Brown.
 Cananga, Rumph.
 Ganophyllum, Blume.
 Corynocarpus, R. & G. Forster.
 Rourea, Aublet.
 Tricholobus, Blume.
 Carmichaelia, R. Brown.
 Ilex, Linné.
 Macgregoria, F. v. M.
 Bischoffia, Blume.
 Aporosa, Blume.
 Dissiliaria, F. v. M.
 Lagerstrœmia, Linné.
 Agrimonia, Linné.
 Amorphospermum, F. v. M.
 Acicalyptus, A. Gray.
 Corylopsis, Sieb. & Zucc. (add. Order Hamamelideæ.)
 Porospermum, F. v. M.
 Aralia, Linné.
 Motherwellia, F. v. M.
 Colmeiroa, F. v. M.
 Embothrium, R. & G. Forster (Sect. Oreocallis.)
 Negria, F. v. M.
 Collocarpus, F. v. M.
 Cypselocarpus, F. v. M.
- Bœhmeria, Jacquin.
 Ulmus, Linné (Sect. Microptelea.)
 Epipogium, Gmelin.
 Eulophia, R. Brown.
 Rhamphidia, Lindley.
 Corymbis, Thouars.
 Goodiera, R. Brown.
 Alpinia, Linné.
 Eleteria, White.
 Amomum, Linné.
 Tapeinocheilos, Miquel.
 Iris, Linné (Sect. Moræa.)
 Aschersonia, F. v. M.
 Chamæscilla, F. v. M.
 Stawellia, F. v. M.
 Floriscopa, Loureiro.
 Clinostigma, Wendl. nepos.
 Arca, Linné.
 Megalotheca, F. v. M.
 Edeiocolea, F. v. M.
 Hypolytrum, L. C. Richard.
 Apluda, Linné.
 Wolfia, Horkel.
 Monogramme, Commerson.
 Spiridens, Nees.

FOSSIL GENERA HITHERTO HERE DEFINED.

- Spondylostrobus, F. v. M.
 Phymatocaryon, F. v. M.
 Trematocaryon, F. v. M.
 Rhytidotheca, F. v. M.
 Plesiocappariss, F. v. M.
- Celyphina, F. v. M.
 Odontocaryon, F. v. M.
 Conchotheca, F. v. M.
 Pentenne, F. v. M.

INDEX OF COLLECTION OF VEGETABLE PRODUCTS SENT TO THE LAST LONDON EXHIBITION.

- Fibre of *Cordyline Forsteri*, F. v. Mueller.
 " " *indivisa*, Kunth.
 " *Yucca gloriosa*, L. and *Y. filamentosa*, L.
 " *Linum usitatissimum*, L.
 " *Fourcroya gigantea*, Vent.
 " *Doryanthes excelsa*, Corr.
 " *Agave Americana*, L.
 " *Hibiscus Syriacus*, L.
 " " *splendens*, Fras.
 " *Pimelea pauciflora*, Br.
 " " *microcephala*, Br.
 " *Arnica montana*, Forst.
 " " *Donax*, L.
 " *Canna edulis*, Edw.
 " *Abutilon venosum*, Hooker.
 " " *striatum*, Dicks.
 " *Dianella longifolia*, Br.
 " *Brachychiton populucum*, Br.
 " *Broussonetia papyrifera*, Vent.
 " *Iris compressa*, Thunb.
 " *Phormium tenax*, Forst. var. *Colensoi*.
 " *Boehmeria nivea*, Gandich.
 " *Antholyza Æthiopica*, L.
 " *Pipturus propinquus*, Wedd.
 " *Juncus vaginatus*, Br.
 " *Sisyrinchium pauciculatum*, Br.
 " *Sida retusa*, L.
 " *Phragmites communis*, Trin.
 " *Anigostanthus flavidus*, Redoute.
 " *Plagianthus pulchellus*, Gray.
- Oil distilled from *Rosmarinus officinalis*, L.
 " " *Melaleuca cricifolia*, Sm.
 " " " *hypericifolia*, Sm.
 " " " *decussata*, Br.
 " " *Eucalyptus diversicolor*, F. v. M.
 " " " *polyanthemus*, Schauer.
 " " " *calophylla*, Br.
 " " " *obcordata*, Thunb.
 " " " *Stuartiana*, F. v. M.
 " " " *goniocalyx*, F. v. M.
 " " " *cornuta*, Labillard.
 " " " *melliodora*, A. Cunningham.
 " " *Callistemon rigidus*, Br.
 " " " *rugulosus*, Cand.
 " " *Agonis flexuosa*, Candolle.
 " " *Lavandula Stoechas*, L.
 " " *Mentha piperita*, L.
 " pressed from seeds of *Papaver somniferum*, L.
 " " " *Helianthus annuus*, L.
 " " " *Brassica oleracea*, L.
 " " " *Linum usitatissimum*, L.
 " " " *Prunus Amygdalus*, J. Hook.
 " " " *Ricinus communis*, L.
- Tar from *Pinus Laricio*, Poiret.
 " " *pinaster*, Soland.
 " " *pinca*, L.
 " " *insignis*, Dougl.
 " " *longifolia*, Roxb.
 " " *Halepensis*, Miller.
 " *Cupressus macrocarpa*, Hartw.
 " *Bursaria spinosa*, Cavan.
 " *Myoporum insulare*, Br.
 " *Casuarina quadrivalvis*, Labill.
 " *Banksia marginata*, Cavan.
 " *Acacia melanoxylon*, Br.
 " " *decurrens*, Willd.
 " *Melaleuca cricifolia*, Sm.
 " *Angophora intermedia*, Cand.
 " *Eucalyptus leucoxyton*, F. v. M.
 " " *obliqua*, PHerit.
 " " *globulus*, Labill.
 " " *rostrata*, Schlecht.
 " Wood-Vingar residue of *Euc. glob.*, Lab.
- Eight small boards coated with different tars.
 Acetic Acid from *Casuarina quadrivalvis*, Labill.
 " " *Banksia marginata*, Cavan.
- Acetic Acid from *Acacia melanoxylon*, Br.
 " " *Acacia decurrens*, Willd.
 " " *Melaleuca cricifolia*, Sm.
 " " *Angophora intermedia*, Cand.
 " " *Eucalyptus leucoxyton*, F. v. M.
 " " " *obliqua*, PHerit.
 " " " *globulus*, Labill.
 " " " *rostrata* (purified), Schl.
- Alcohol, 10 samples from the preceding 10 kinds of wood.
- Galls from *Acacia pycnantha*, Benth.
 " " *acinaea*, Lindl.
 " " *decurrens*, Willd.
- Hops from *Humulus lupulus*, L.
 Nnts from *Helicia tenuifolia*, F. v. M.
 Tea from *Thea Chineensis*, Sims.
 " " " var. *Assamica*.
 Medicinal Bark of *Pimelea serpillifolia*, Br.
 Truffle, *Mylitta Anstralis*, Berk.
 Kino from *Eucalyptus viminalis*, Labill.
 Crude Potash from *Eucalyptus viminalis*, Labill.
 " " " *rostrata*, Schlecht.
 " " *Dicksonia antarctica*, Labill.
- Starch from grains of *Andropogon saccharatus*, Roxb.
 " roots of *Rumex bidens*, Br.
 " " *Typha Muelleri*, Rohrbach.
 " " *Ipomoea Batatas*, Poir.
 " " *Scirpus maritimus*, L.
 " " *Canna edulis*, Edw.
- Acetate of Soda from *Eucalyptus globulus*, Labill.
 Acetate of Lime from *Eucalyptus globulus*, Labill.
 Paper from Bark of *Pimelea microcephala*, Br.
 " " *Eucalyptus goniocalyx*, F. v. M.
 " " " *globulus*, Labillard.
 " " " *corymbosa*, Smith.
 " " " *amygdaliua*, Labill.
 " " " *Stuartiana*, F. v. M.
 " " " *rostrata*, Schlecht.
- Aloe by exudation from *Aloe socotrina*, L.
 " pressing " "
 " boiling " "
 " pressing " *plicatilis*, Mill.
 " " " *saponaria*, Haw.
 " " " *arborescens*, Mill.
- Pitch from *Pinus insignis*, Dougl.
 " " *Halepensis*, Mill.
 " " *Eucalyptus globulus*, Lab.
- Catechu from *Acacia decurrens*, Willd.
 " " var. *dealbata*, Link.
 " " *saligna*, Wendl.
 " " *pycnantha*, Benth.
- Sandarac from *Callitris verrucosa*, Br.
 Gum from *Acacia homolophylla*, A. Cunn.
 " *Brachychiton populucum*, Br.
- Lerp manna from *Eucalyptus oleosa*, F. v. M.
 Opium from *Papaver somniferum*, L.
 Safflower from *Carthamus tinctorius*, L.
 Sumach from *Rhus coriaria*, L.
 " " *glabra*, L.
 " " *typhina*, L.
- Scotino from *Rhus Cotinus*, L.
 Young fustic of *Rhus Cotinus*, L.
 Salep of *Microtis porrifolia*, Spreng.
 Snuff of *Myriogyne minuta*, Less.
 Liquorice root of *Glycyrrhiza glabra*, L.
 Cigars from leaves of *Eucalyptus globulus*, Lab. (six sorts under Ramel's patent)
- Fluid Kino of *Eucalyptus obliqua*, PHerit.
 Varnish from Resin of *Xanthorrhoea Australis*, Br., and Alcohol of *Euc. globulus*
 Saponin of *Albizzia lophantha*, Benth.
 Caoutchouc of *Ficus macrophylla*, Desfont.
 " " *carica*, L.
- Alcohol from the sawdust of *Eucalyptus rostrata*, Schl.
 Eight distinct oils from the tar of *Eucalyptus globulus*, Lab.

PROPORTIONS OF YIELD OBTAINED FROM VARIOUS VEGETABLE PRODUCTS AT
BARON VON MUELLER'S LABORATORY IN 1873.

Potash from the ashes of <i>Eucalyptus rostrata</i>	005·0	Tar from fresh wood of <i>Pinus pinaster</i> (approx.)	002·0
Potash from the ashes of <i>Dicksonia antarctica</i>	004·0	„ <i>Pinus pinea</i>	002·0
Tannin from the Catechu of <i>Acacia decurrens</i>	055·0	„ <i>Pinus insignis</i> ...	002·0
Saponin from the dried bark of the stem of <i>Acacia decurrens</i>	005·0	„ <i>Pinus longifolia</i>	002·0
Cacutchou from sap of <i>Ficus macrophylla</i> ...	033·0	„ <i>Pinus Halepensis</i>	002·0
Tar from fresh wood of <i>Pinus Laricio</i> (approx.)	003·0	„ <i>Cupressus macrocarpa</i> ...	004·0
„ <i>Pinus silvestris</i>	003·0	„ <i>Bursaria spinosa</i>	003·0
		„ <i>Casuarina suberosa</i>	002·0
		„ <i>Myoporum insulare</i>	002·0

WORKING EXPENSES OF THE DEPARTMENT OF THE GOVERNMENT BOTANIST FROM
1ST JULY 1873 TO 30TH JUNE 1874.

	£	s.	d.
Salary to Clerk and Museum Assistant	140	17	0
Salary to Assistant for out-door work—By Government paid for 33 days	12	7	6
Museum Material, from Sands and McDougall	31	18	11
Museum Material, from Moubray, Lush and Co.	6	3	0
One Venetian Blind	2	10	6
Office Stationery	11	17	4
Paper, Pasteboards &c., for Educational Collections	14	3	8
Remuneration to Orphan Boys	1	19	6
Cryptogamic Plants from Dulan and Co., for Museum	7	9	0
Queensland Plants, from S. H. Eaves, for Museum	5	0	0
Plants from Lord Howe's Island, from J. P. Fullagar, for Museum	10	0	0
Freight and Incidental Expenses	22	16	10
Conveyance and Wages on Professional Journey to Upper Yarra and Upper Goulburn	9	11	0
Conveyance and Wages on Professional Journey to the Hume River District and Northern Snowy Mountains	8	14	6
Conveyance and Wages on Professional Journey to Mt. Emu, Mt. Gellibrand, Curdie's Creek and Ranges west of Cape Otway	13	0	0
Conveyance to Fernshaw and back	1	7	0
	£299	15	9
Unexpended balance	0	4	3
	£300	0	0

* * * The item of £100 for publishing works on plants was transmitted to London for copies of the sixth volume of the *Flora Australiensis*, as on former occasions.