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NEWS-LETTER OF THE SOUTH AFRICAN ASSOCIATION OF BOTANISTS
NUUSBRIEF VAN DIE SUID-AFRIKAANSE GENOOTSKAP VAN PLANTKUNDIGES

DIE SUID-AFRIKAANSE RAAD VIR NATUURWETENSKAPLIKES: Die Minister van Staat=
kundige Ontwikkeling het prof. Nathanaël Grobbelaar van die Departement Plantkunde,
Universiteit van Pretoria, vanaf 1 September 1982 vir 'n termyn van drie jaar in die
Suid-Afrikaanse Raad vir Natuurwetenskaplikes aangestel. Prof. Grobbelaar tree op
as benoemde van die Suid-Afrikaanse Genootskap van Plantkundiges. Die eerste
vergadering van die SARN, wat ingevolge die Wet op Natuurwetenskaplikes (Wet no. 55
van 1982) ingestel is, het op 2 September 1982 by die Universiteit van Pretoria
plaasgevind.

DEPARTEMENT OF BOTANY, UNIVERSITY OF NATAL, PIETERMARITZBURG:

Staff: The teaching staff of the Department comprises: Professor R.N. Pienaar
(Head); Associate Professors, Professor A.R.A. Noel, Professor J. van Staden and
Professor C.M. Breen; Senior Lecturers, Dr. N.A.C. Brown and Dr. F. Getliffe-
Norris; Lecturers Mr. E.G.J. Akhurst and Dr. R.H. Mepham (Biology); Mr. M. Aken
(temporary) and Dr. A. Critchley (from January 1983).

The Curator of the Herbarium is Associate Professor O.M. Hilliard and C.S.I.R.
Research Fellow in Phycology is Dr. R.E. Norris.

Student Statistics: Undergraduate student numbers for 1982 are Botany I (112
students), Biology I (115 students), Botany II (33 students), Botany III (25
students), Botany Honours (6 students) and Agricultural Plant Physiology (28
students).

Postgraduate registration comprises 17 M.Sc. students and 10 Ph.D. students.

General News: Mr. J.C. Manning, a third year student, was awarded both the A.W.
Bayer Book Prize for the best student in Ecology and the K.D. Gordon-Gray Book
Prize for the best student in Biosystematics in 1982.

Work is progressing with the building of the new Biology Block to house the
Departments of Botany and Zoology, the Herbarium, Zoology Museum and the Electron
Microscope Unit. It is hoped that the building which adjoins the Faculty of
Agriculture will be ready for occupation in June 1983.

Research Activities: The major research fields in the Department are Phycology, Anatomy, Biosystematics, Ecology and Physiology.

Phycological research currently undertaken by Professor R.N. Pienaar, Dr. Isao Inouye (postdoctoral student), Mr. M. Aken (Ph.D. student) and Mr. I Harper (M.Sc. student) includes a detailed account of the marine and estuarine nanoplankton occurring off the Natal coast, involving a detailed investigation of nanoplankton diversity, taxonomy and developmental biology of selected species. Particular attention is being given to members of the Prymnesiophyceae, Prasinophyceae, Cryptophyceae and the Dinophyceae. A major 5 year programme on the Benthic Marine Algae of Natal and Zululand was commenced in January 1982. This work is being carried out by Dr. R.E. Norris, Professor R.N. Pienaar and Mr. B. Emanuel. It is hoped that at the end of the programme the marine flora of Natal will be published. Miss Shirley Meyer was awarded her M.Sc. with distinction for a detailed investigation on a new species of Chroomonas (Cryptophyceae).

Dr. R.E. Norris has donated his entire herbarium of marine algae to the University of Natal Herbarium. This will provide a major source of reference material for future work on marine macroalgae.

Professor R.N. Pienaar attended the First International Phycological Congress in St. John's, Newfoundland, Canada, from August 8-14th 1982. He read a paper which he co-authored with Dr. I. Inouye, a Japanese phycologist, who is completing post-doctoral studies at the University of Natal, Pietermaritzburg. The paper was entitled, "Observations on the life cycle and microanatomy of Thoracosphaera heimii (Lohmann) Kamptner (Dinophyceae) with special reference to its systematic position". The paper aroused considerable interest at the Congress for two reasons; firstly, because similar work on the life cycle has just been completed by a Norwegian worker, and secondly, because the systematic position of Thoracosphaera heimii has been a subject of controversy for many years. In the past it has been classed as a member of the Class Prymnesiophyceae but Dr. Inouye has detailed ultrastructural evidence to prove that this organism is in fact a member of the Dinophyceae. According to the Norwegian delegates at the Congress, Dr. Inouye has added considerable detail to the life cycle studies completed in Norway.

Prof. A.R.A. Noel is engaged in long-standing studies in plant tissue and cell differentiation, with special emphasis on wall elaboration in some less commonly known examples. Thus he is presently working on a survey of endothecium wall thickening, in the course of which over six hundred preparations and many photomicrographs have already been assembled. Although

primarily a study of cell differentiation, this work clearly has taxonomic and phylogenetic significance. A further programme of systematic anatomy is being undertaken with Miss M. Still on pit vesturing in the wood of Acacia species. The taxonomic significance of this feature is controversial and its variation within and between taxa is being examined at the S.E.M. level. In the field of ultrastructure, studies are continuing on the role of microtubules in discontinuous wall thickening, based upon the fascinating testa hairs of Impatiens.

Professor O.M. Hilliard has completed a fascicle of Vol. 33, Compositae (Gnaphaliinae) for the Flora of southern Africa. This is with the printers and should appear in 1983. It covers the genera Achyrocline, Edmondia, Eriosphaera, Facelis, Gnaphalium, Helichrysum, Lasiopogon, Plecostachys, Pseudognaphalium, Tenrynea, Troglophyton and Vellereophyton; and is illustrated with numerous line drawings as well as distribution maps.

During a recent visit to Kew and Edinburgh, she and Mr. G.L. Burttt finalised their account of Zaluzianskya (Scrophulariaceae) in south-eastern Africa. They are currently revising the perennial species of Diascia (Scrophulariaceae) as well as Dierama (Iridaceae) and would be glad to receive living material of both genera. This revisionary work stems in part from a survey they are doing of the plants of the southern Natal Drakensberg above 1800 m.

Dr. F. Getliffe-Norris is pursuing her interests in the Cyperaceae with a major project on Tetraria Beauv. and continuing research on the anatomy of sedges and maintaining an interest in Acanthaceae. Mr. L. Vincent has presented his M.Sc. thesis entitled "Taxonomic studies in the genus Aristea Ait. (Iridaceae) in the Summer Rainfall area of southern Africa", and awaits the results. He intends continuing his postgraduate studies with an investigation of sectional limits in Senecio. Mr. A. Nicholas, now working at the Forestry Herbarium in Pietermaritzburg, is rounding off his research on the narrow-leaved species of Asclepias and will be presenting his M.Sc. thesis in due course. Mr. K. Balkwill is registered for an M.Sc. and is engaged in taxonomic studies in the Acanthaceae.

The major part of the ecological research effort of the Botany Department is being directed at a multidisciplinary study of processes affecting and reflecting nutrient cycling in Lake Midmar. Organisations contributing to the programme are National Institute for Water Research (Natal Regional Office) and the Departments of Zoology and Botany of the University of Natal. Mr. E.G.J. Akhurst (Lecturer in Botany) is studying the factors controlling phytoplankton production and Professor R.N. Pienaar is investigating phytoplankton community structure and succession. Professor C.M. Breen has together with Dr. A. Twinch (now at the NIWR in Pretoria) been investigating phosphorus cycling in the water

column and the sediment:water exchange processes. Other projects involve the dynamics of grasslands on the eastern shores of Lake St. Lucia (Mr. D. Conlong) and aluminium toxicity and tolerance (Mr. R. Bennet).

Dr. R.H. Mepham, Lecturer in Biology, is interested in mangroves, in particular, the origin, evolution and fossil history of mangroves. He has a research project on the Mlalazi Estuary at Mtunzini, where he is investigating factors influencing seedling establishment, and is monitoring growth and mortality rates among young mangrove trees. He recently visited mangrove forests and prawn culture projects in Borneo and Sumatra, as a guest of North Borneo Timbers Ltd., and also attended a regional meeting on the management of lowland tropical swamp forests in Kuala Lumpur. His other principal interest is in pollen physiology, especially as it reflects upon evolutionary trends in angiosperms.

Physiological research is mainly in the broad field of plant hormones and their involvement in plant growth and development. The research includes work on seed dormancy and germination, tissue culture and transport and metabolism of cytokinins. Professor J. van Staden, Dr. N.A.C. Brown and sixteen postgraduate research students are working on projects in these fields. Mr. A.B. Keegan (Ph.D. student) has recently completed his research on "Seed dormancy and germination in Ricinodendron rautanenii (Manketti nut)" and has joined the staff of Bayer Pharmaceuticals in the Transvaal. Miss M. Hutton (Ph.D. student) is writing up her work on "The transport and metabolism of cytokinins in plants". Mr. N. Hendry (Ph.D. student) is completing his research on the "Hormonal regulation of juvenility in Citrus". Mr. B. Featonby-Smith (Ph.D. student) is working on the "Endogenous hormones in Ecklonia maxima" and Miss Y.M. Page (Ph.D. student) is working on "The Physiology of Hypoxis rooperi". Mr. R. Melis (Ph.D. student) an Anglo American Research Fellow, is working on "Flowering and Tuberization in Casava". Postgraduate students who will be submitting their M.Sc. theses shortly are: Miss D. Peters (Tissue culture studies on Peperomia clusifolia and Strongylodon macrobotrys); Miss C. Forsyth (Tissue culture studies on Dioscorea), Miss P. Campbell (Seed dormancy and germination in Rubus cuneifolius); Miss J. Graaff (Seed dormancy and germination in Sesbania spp.); Mr. D. Erasmus (Translocation studies in Rubus cuneifolius).

Postgraduate students who have recently registered for the M.Sc. degree are: Miss P. Mooney (Cytokinins in Marine Algae); Miss E. Cook (Regulation of longevity in carnation flowers); Mr. W. Nelson (Effect of seaweed concentrates on the growth of wheat); and Miss J. Mitchell (Seed germination in Proteaceae). Mrs. M.G. Gilliland, who recently retired as Officer in Charge of the Electron

Microscope Unit in Pietermaritzburg, has joined Professor Van Staden as a C.S.P. Research Assistant and is working on abscission in Parthenium argentatum (Guayule).

During July 1982 Professor J. van Staden attended the 11th International Conference on Plant Growth Substances at Aberystwyth, U.K. where he presented an invited paper on "The role of cytokinins in seed dormancy and germination". On his way to the U.K. he spent two weeks in West Germany with Professor H. Senger at Phillips University in Marburg, and with Professor Richter at the University at Hanover. Professor van Staden is currently continuing his research on cytokinin metabolism and the role of the respective compounds on germination, senescence and flowering. Dr. N.A.C. Brown is continuing his study of seed germination in Bidens spp. and Protea spp. He is also investigating endogenous hormone levels in relation to flowering in Kalanchoë blossfeldiana.

BOTANICAL RESEARCH INSTITUTE; a review of the work of the Institute for 1981/82: The highlight of the year undoubtedly was the AETFAT Congress held in Pretoria in January 1982. This meeting was financed by the Department of Agriculture and Fisheries and organized jointly by the Botanical Research Institute and the South African Association of Botanists with the assistance of the CSIR Symposium Secretariat.

The impact of the influx of eighty overseas botanists including some of the foremost authorities in the botanical field was considerable and will make itself felt for many years to come. The congress was a great social success and gained many friends for South Africa as a result of the exceptional hospitality shown to visitors and the greater insight they gained in the South African situation. More important, however, is the awareness of the progress made with botanical research in South Africa which has been gained by overseas botanists and the increased stature which the country thus stands to achieve.

The opportunity offered by the presence of a number of the world's most outstanding taxonomists was utilized by organizing a workshop on one of the most pressing botanical needs, namely the completion of the Flora of Southern Africa. The meeting resulted in an excellent document which dealt with the problem in a penetrating manner and makes practical recommendations to rectify the situation.

It is most gratifying that scientific productivity in the form of publications remains high. Ninety-two papers were, for instance, published by the staff of the Botanical Research Institute chiefly in Bothalia, the general house journal of this Institute. The quality of some of the publications was excellent and

there seems to be a noticeable improvement in the papers as a result of the standard insisted on.

An event of particular significance was the creation of additional posts for the Ecology Section of the Botanical Research Institute. This should allow the botanical aspects of natural resource surveys to be placed on a sound footing once the posts have been adequately filled.

Two interesting and valuable works appeared during the year under review. The first is the long awaited 'Botanical Exploration of Southern Africa' by Mary Gunn and L.E.W. Codd. This book is the culmination of a lifelong research on botanical collectors of Southern Africa by the first author, most ably amplified and written up by the second author. It will remain a standard work on the subject for many years to come.

The second work is the first part of the volume on mosses in the Flora of Southern Africa series. This amply illustrated work is a landmark study of Southern African mosses and the artist as well as the author R.E. Magill are to be congratulated.

The herbarium information data bank PRÉCIS II is operational, and useful results are beginning to appear. Refinement of the data is still needed.

Except for the vacant new ecology posts, botanical professional posts are all filled. Even so, the needs for botanical work are increasing and expansion will be urgently needed as soon as the economic situation improves.

HERBARIUM SERVICES SECTION: The four herbaria of the Institute continued to identify plants and provide information for a wide range of people including officers of the Institute, various State and Provincial Departments, Universities and the public both in South Africa and its neighbouring states.

National Herbarium, Pretoria (PRE). Mr. E.G.H. Oliver, who administered the herbarium section for the past six years, has left Pretoria on transfer to Stellenbosch, where he is working intensively on Ericaceae. Mrs. E. van Hoepen (acting curator) and Miss W.G. Welman (finances) have taken over the administration.

A total of 14 600 specimens was named and about 530 visitors were dealt with. 13 068 accessions were made to the herbarium. During the year 57 loans (7 484 specimens) were sent to other Institutes, and 35 loans (4 175 specimens) were received. PRE received 1 654 specimens on exchange, and sent out 1 190 during the year.

Numerous collecting expeditions were undertaken during the year, of which the more important were to the north-western Transvaal, an area which is poorly represented in PRE, northern Natal, the western C.F.S., north-eastern Cape and the Karoo, the south-western Cape, coastal areas of the southern and eastern Cape and Natal, and eastern Lesotho.

The replacement of old herbarium cabinets by new modular steel cabinets continued. The old cabinets were sent to our units in Durban and Stellenbosch to replace old and unsuitable cabinets and provide much-needed expansion. To accommodate the rapidly expanding lichen collection eight cabinets of the type used for fossil collections have been temporarily placed in the western light well in the basement.

As regards visitors to the Herbarium, a record year was experienced, largely due to the AETFAT Congress. Many delegates took advantage of their visit to Pretoria to spend some time in the herbarium working on their particular interests. Among the overseas visitors were Prof. J.P.M. Brenan, ex-director of Kew; also from Kew came Dr. W.D. Clayton and Mr. F.N. Hepper; Drs. E. Launert and N.K.B. Robson from the British Museum; Mr. F. White from Oxford; Prof. K. Dahlgren from Copenhagen; Prof. and Dr. O. Hedberg from Uppsala, Dr. O. Almborn from Lund and Prof. R.B. Nordenstam from Stockholm; Dr. I. Kukkonen from Helsinki; Prof. and Dr. D. Müller-Doblies from Berlin (who spent several months in South Africa mostly collecting in the S.W. Cape), Prof. H-D. Ihlenfeldt and Dr. H.E.K. Hartmann from Hamburg, who also spent extra time in the field on collecting; Prof. F. Weberling from Erbach, Prof. W. Rauh from Heidelberg; Prof. R.W. Wendelberger from Vienna; Dr. A.J.M. Leeuwenberg and Dr. D.O.W. Wijnands from Wageningen, Prof. M.J.A. Werger and Dr. C.C. Berg from Utrecht, Dr. F. van der Meulen from The Hague; Prof. J.E.J. Lambinon and Dr. E. Serusiaux from Liège, Dr. P. Bamps from Meise and Dr. P. Goetghebeur from Gent; Dr. P.H. Raven, Dr. P. Goldblatt and Dr. M.R.C. Crosby from Missouri Botanical Garden, St. Louis; Prof. W.H. Eshbaugh from Oxford, Ohio; Drs. R.B. Faden and A. Goldberg from the Smithsonian Institute, Washington, Prof. P.G. Mahlberg from Bloomington, Indiana and Dr. H. Eichler from Canberra. From neighbouring states came Dr. S. Talukdar and Mrs. M.O. Schmitz (whose recent death was a great shock to all who knew her) from Roma, Lesotho; Mr. E.N. Netshiungani from Venda and Mr. O.H.D. Makunga from Fort Hare University.

Delegates to the Congress included botanists from all South African universities, Kirstenbosch, Nature Conservation and the Parks Board, many of whom made use of the herbarium while in Pretoria.

All of the herbarium staff were involved in some way or other with the AETFAT

Congress and all spent a good deal of time preparing for the congress or helping assist or entertain the delegates. Identifications of specimens collected by our overseas visitors was completed as soon as possible. As a result a backlog of about four months of our normal work has built up, and we are very much in arrears with identifications.

Other visitors during the year included Dr. Juliet Prior, from London, who is doing archaeological work in Swaziland, and Mrs. E.S. Kamp from Mbabane, who is working on updating the expanding the Swaziland checklist.

Wing A: Mrs. van Hoepen continued to control the wing in a part-time capacity, while also controlling the information and identification services.

Miss C. Reid is continuing her studies on the Cyperaceae including field work, and has done a great deal of curating and correcting of misidentifications.

Miss L. Smook has initiated a project in which eventually all the herbarium professional officers will participate, namely filling in gaps in our collections from under-collected areas. In this connection the computer has given valuable information and maps have been drawn up showing the number of collections per grid. She is also working on her booklet on the grasses of the Transvaal, and recording all common names of grasses she encounters.

Wing B: Mr. G. Germishuizen, due to prolonged sick-leave following a serious operation, was not yet able to complete his project on Polygonaceae but should do so by the end of 1982. The book on Transvaal Wild Flowers with paintings by Mrs. Fabain is nearing publication and Mr. Germishuizen, who was responsible for the text, had to check the proofs. Another book for which he wrote the botanical descriptions, that of Dr. Fox on Edible Plants, will also appear in print shortly.

Mrs. L. du Toit gave valuable help in bringing Cythna Letty's Wild Flowers of the Transvaal up to date for the printing of a second edition. We were sorry to lose her when she resigned at the end of November. She has been replaced by Mrs. P. Olivier. Mrs. I.R. Leistner who also resigned has not yet been replaced.

The data bank encoders work in this wing and the spirit collection is also housed here.

Wing C: Miss E. Retief who is in control of this wing is continuing her studies of the Campanulaceae and is also assisting Mr. P. Herman in his work on the identification of fruits and seeds. At the AETFAT Congress they jointly presented a post paper on this subject.

Mr. Herman is continuing work on this long-term carpological project, and has rounded off his work on Pavetta. He is responsible for most of the routine identification work in this wing.

Mrs. M.J.A.W. Crosby who assisted with identifications in this wing was transferred to Wing D in January 1982.

During an overseas holiday tour Miss E. Retief paid visits to Edinburgh, Kew, Heidelberg and Genève herbaria.

Wing D: Miss W.G. Welman, who controls this wing continues as regional extractor for Excerpta Botanica (Taxonomica) and has numerous administrative duties. A great deal of her time was spent in preparation for the AETFAT Congress. Among other duties she was responsible for the flowers used as decorations at the Congress and the "Meet and Greet" function at the start of the meeting. On the departure of Mr. Oliver she is now responsible for the herbarium finances.

Mrs. S.J. Smithies resigned in July 1981, and Mrs. Crosby is now assisting with identifications in this wing.

Cryptogams: The departure of Dr. R.E. Magill, who left in December 1981 for Missouri after completion of his contract left a gap in this section. Before leaving, however, he saw Bryophyta, part I, fasc. 1 in the Flora of Southern Africa series appear in print, and he is continuing his work on South African mosses, assisted by Mr. J. van Rooy, who has taken over the Moss herbarium. Mr. van Rooy recently obtained his B.Sc. degree.

Mr. F.A. Brusse has been working steadily at the lichen collection and spent four weeks on a field trip in the south-western Cape collecting for PRE. At present the lichens are housed under very cramped and unsatisfactory conditions in an open passageway, but we hope to have better accommodation within a few months.

Mrs. S.M. Perold who assists with Bryophyte identifications and research, is also working on a Ricciaceae project. She operates the SEM in the examination of plant material for various taxonomists.

Mrs. G.L. Radmacher, who was responsible for checking grid references, left the Institute in May 1981 to get married and is now living in West Germany. Mrs. I. Ebersohn who ran the service room (reception and sorting of incoming parcels, loans, listing of identifications, etc.) was transferred to the Administration section in January 1982 and has been replaced by Mrs. M. Dednam.

Natal Herbarium, Durban (NH). A total of 2979 specimens was named, 499 visitors were dealt with as well as 6 student groups. Accessions to the herbarium numbered 1698; 1435 specimens were sent out on loan to various institutes.

Mr. B.D. Schrire, the officer in charge of the unit, continued his studies of the Desmodieae, is working on the history of the Natal Herbarium and the collections housed therein with a view to its forthcoming centenary, and with the help of the Durban Parks department has done a major clean-up and reorganization in the garden.

Mrs. B.J. Pienaar left the unit in June 1981 to take up duties in Pretoria in the Plant Exploration section and was replaced by Mrs. M. Jordaan. Mrs. C.E. Young who resigned in September 1981 was succeeded by Mrs. M.K. Lynch and Mrs. L. Nichols left at the end of February 1982.

In spite of this turnover of staff work at the unit is progressing smoothly, thanks to the organizing ability and leadership of Mr. Schrire.

Albany Museum, Grahamstown (GRA): A total of 1979 specimens was identified and 847 visitors as well as 7 groups of students, totalling 99, was dealt with. Accessions to the herbarium numbered 1108. 19 loans totalling 1651 specimens were sent out and 463 donations of specimens were received, including 200 samples of kudu rumen.

Mrs. E. Brink continues as officer in charge of the herbarium and information service, with the able assistance of Dr. A.F.M.G. Jacot Guillarmod.

Seven displays were arranged in the museum foyer. The Grahamstown Nature Reserve, where encroachment by alien *Acacia*, *Hakea*, etc. is the main problem, was administered.

A start has been made in the moving of valuable plant specimens from the Albany Museum garden to the 1820 Settlers Wildflower Reserve to make way for the proposed extension to the Museum building due to start during the latter half of 1982. The herbarium will eventually be housed in the new extension and will have to be packed up during building operations, a major undertaking.

Government Herbarium, Stellenbosch (STE): The number of specimens identified totalled 4577; visitors numbered 388; accessions to the herbarium numbered 4761 and 17 loans totalling 955 specimens were sent out.

Mrs. L.v.Zyl continues as curatrix of the herbarium. During February 1982 a number of AETFAT delegates were taken on a tour of the south-western Cape

and as a result the herbarium dealt with a large number of identifications for these visitors.

Mrs. C.M. van Wyk and Mrs. A.C. Fellingham assisted with identifications and general herbarium work.

Mrs. R.M. Wikner handled the technical aspects of the herbarium work with great efficiency.

Numerous collecting trips were undertaken and several flower shows were attended, where assistance was given in the identification of indigenous exhibits.

FLORA RESEARCH SECTION: The task of the section is to research into the taxonomy of the living and extinct plant species of Southern Africa, and to pass on the knowledge gained to expert and layman alike, mainly through publications.

Flora of Southern Africa: An international workshop session on the Flora was held during January with the aim of finding ways to speed up production of this work. The workshop was attended by 59 botanists. A drafting panel consisting of directors and senior researchers of leading biological research organization in the United Kingdom, the United States of America, Sweden and South Africa reported on the results of the workshop to the congress of AETFAT and submitted a formal document to the Minister entitled the Flora of Southern Africa - a case for increased support for a research project of international scope and impact. The drafting panel of this document consisted of: Prof. J.P.M. Brenan, Dr. B. de Winter, Prof. O. Hedberg, Dr. E. Launert, Dr. O.A. Leistner and Dr. P.H. Raven. At a Plenary Meeting of AETFAT a resolution was passed unanimously in which delegates 'petition the Botanical Research Institute and the Government of the Republic of South Africa to take all possible steps to bring this vital project to a timely conclusion'.

During the AETFAT congress the state of progress of the project was demonstrated in a poster paper.

The two works were published during the year. The first is an introductory volume and the second a fascicle in the Cryptogam series. Both are discussed below.

Members of the Institute reported as follows on progress with research fascicles on volumes of the Flora:

Vol. 2: Register of names and types for Poaceae. Dr. G.E. Gibbs Russell has completed this research facet. All names have been added to the Register from the Chase Index, Flora Capensis, Flora of Tropical Africa and various smaller accounts of southern African grasses. There are roughly 4 250 names in the

Register, and it is expected that more will be added in the future.

Poaceae - Meliceae. This facet was terminated by Dr. G.E. Gibbs Russel during 1981 and the findings were accepted for publication in *Bothalia*.

Keys to Southern African grasses. Dr. G.E. Gibbs Russel sent draft copies of identification keys to genera and species, with information on recent synonymy, distribution and vegetative morphology for each species, to university departments of botany and pasture science for use and comments. The tribes Agrostideae, Andropogoneae, Bambuseae, Centosteaceae, Maydeae, Meliceae, Olyreae, Oryzae, Pappophoreae and Stipeae have been sent out. Arundineae, Ehrharteae and the first genera of Paniceae have also been completed.

Poaceae - Subfamilies Oryzoideae, Centostecoideae and Bambusoideae. In another research facet by Dr. G.E. Gibbs Russell, all tribes have been studied in a preliminary way, provisional keys were written and species concepts formulated. The most difficult genus, Ehrharta, has been studied in detail and descriptions of two sections were written. Drawings of all genera have been completed except for the Bambuseae, which is dealt with by an outside collaborator.

Vol. 4: Xyridaceae, Eriocaulaceae, Commelinaceae, Pontederiaceae and Juncaceae. The facet was completed by Mrs. A.A. Mauve. Only the genus Aneilema, which is being revised by an overseas researcher, is still outstanding. Parts of the manuscript were amended after discussions with experts from overseas.

Restionaceae. A checklist by Dr. H.P. Linder of the Southern African Restionaceae has almost been completed in consultation with Miss E. Esterhuysen of the Bolus Herbarium of the University of Cape Town. This list presents initial hypotheses on supra-specific groups, indicates problem species and species aggregates, and includes all new species. It thus provides the framework on which the remainder of the taxonomic work on the group will be done. Study of seeds and pollen has been commenced with the aid of the scanning electron microscope. First results indicate that taxonomically important information can be expected from this study.

Vol. 5: Liliaceae - Dracaenoideae and Asparagoideae. A revision of the genus Asparagus published in 1966 is being updated and adapted to the Flora format by Mrs. A.A. Mauve. A few new species have been recognized. There appears to be a taxonomically important correlation between the inflorescence tupe and the root system.

Vol. 7: Iridaceae. Editing of the fascicle on Syringodea and Romulea by Prof. M.P. de Vos of the University of Stellenbosch was completed.

Vol. 8: Orchidaceae - Disinae. Studies on the systematics of the Disinae have been completed by Dr. H.P. Linder. Various publications on the group have been published in journals both in South Africa and overseas. Information on the phytogeography of the Disinae was presented at the AETFAT congress. Two workshops were held on the cladistic classification techniques employed in the project.

Vol. 11: Mesembryanthemaceae - Ruschiinae. Dr. H.F. Glen investigated microscopic seed characters of about 100 species. He took colour microfilm photographs of all types of Ruschiinae at Kew and assigned most of the unidentified material of that group at Kew to previously known taxa. Cytological investigations proved taxonomically unfruitful.

Vol. 18: Burseraceae. An account of the genus Commiphora by Prof. J.J.A. van der Walt of the University of Stellenbosch is being edited.

Vol. 21: Tiliaceae. The completed manuscript of this family is being updated by Dr. L.E. Codd.

Vol. 25: Ericaceae. Two new species were described in the genera Erica and Scyphogyne by Mr. E.G.H. Oliver.

Vol. 28: Lamiaceae. Thirteen genera (including Salvia and Stachys) totalling 95 species, which had been revised previously by Dr. L.E. Codd, were rewritten by him in the new format. He also revised and wrote up seven genera with a total of 28 species. A display of live plants of the genus Plectranthus was held at Kirstenbosch during February to demonstrate the horticultural value of this group. More than 30 species, with many cultivars, were exhibited.

Vol. 30: Acanthaceae - Justicia. Miss K.L. Immelman investigated all collections from the National Herbarium, Pretoria and about half the collections from other South African herbaria. The information has been taken up in a card index. Preliminary distribution maps, descriptions and a key to species have been drawn up.

Vol. 33: Asteraceae - Gnaphaliinae. A manuscript by Prof. O.M. Hilliard of the University of Natal, dealing with 330 species, has been edited in parts and will go to the printer soon.

Cryptogams - Algae. A checklist of macrophytic marine algae by Prof. S.C. Seagrief of Rhodes University is being prepared for publication.

Cryptogams - Bryophyta. Part I, fascicle 1 of this work, which deals with 190 species of mosses of the families Sphagnaceae to Grimmiaceae, prepared by

Dr. R.E. Magill and Mr. J. van Rooy, was published. The work includes 83, mostly full-page, plates of very detailed pencil drawings and 110 distribution maps. The introduction gives hints on collecting and identification of mosses and includes a comprehensive illustrated glossary. The manuscript for the major part of fascicle 2 has been received. Work is proceeding on the rest of fascicles 2 and 3.

Cryptogams - Pteridophyta. Text of 38 species of several families such as Polypodiaceae was received from Prof. E.A. Schelpe of the Bolus Herbarium of the University of Cape Town. Editing of 180 species previously received was largely completed.

Botanical exploration of Southern Africa: A book with this title written by Miss M.D. Gunn and Dr. L.E. Codd, was published for the Institute by A.A. Balkema. The work consists of two sections. The first gives an historical outline of the expeditions, collecting and publications concerning South African plants up to the middle of the 18th century. The second section is a dictionary of plant collectors comprising some 3 300 entries of which about half are provided with biographical notes. The book has 400 pages and includes 81 reproductions of old botanical pictures and maps and 440 portraits.

Ceropegia and related genera. The first printers' proofs of this semi-popular treatise by Dr. R.A. Dyer on the genera Ceropegia, Riocreuxia and Brachystelma have been corrected and returned. The book is being published for the Institute by A.A. Balkema.

Register of plant taxonomic projects: The latest edition of this work has been prepared for publication in the forthcoming volume of the AETFAT Bulletin.

Pretoria Flora: Camera-ready copy of 52 of the projected 750 pages of this work was completed. It includes identification keys and text of the families Cyperaceae, Liliaceae and Euphorbiaceae. Text of a further 384 species belonging to the ferns and 45 families of flowering plants was typed. Some of the larger families included are Aizoaceae, Apiaceae and Verbenaceae.

Palaeoflora of Southern Africa: Camera-ready copy of the revision of the genus Dicroidium, which is undertaken by Drs. J. and H. Anderson, has been completed. It comprises 78 one-colour pages, 40 pages with two-colour line illustrations and 110 pages with black/white photographic plates. The work is to be published by the private sector.

Liaison officer, Kew: The former incumbent, Dr. H. Glen, continued to provide information concerning mainly the taxonomy and nomenclature of southern African

plants to the Institute and to other botanical research centres in South Africa and overseas. He also assisted in the mounting of an exhibition of botanical art by Cythna Letty, formerly of this Institute, at the galleries of the Royal Horticultural Society in London. For this exhibition she was awarded the Grenfell silver-gilt medal of the Society. Research work by the liaison officer was directed mainly towards numerical taxonomy of the Mesembryanthemaceae. Dr. Glen was succeeded in July by Dr. H.P. Linder.

Herbarium activities - PRECIS: PRECIS, the computerized data base of the National Herbarium, was restructured by Dr. R.E. Magill and Dr. G.E. Gibbs Russell, to make its operation more economical and flexible. The system was reduced in size by converting it to a strictly specimen-based data bank. All ecological and economic data was eliminated. Grid references have now been inserted on about 330 000 of the specimens in the base and the system is now in active operation.

PLANT STRUCTURE AND FUNCTION SECTION: The year under review has been very productive and stimulating with good progress being made on all the research projects of the section. There have been no staff changes and all projects have advanced to the stage where results will soon be forthcoming.

Comparative grass leaf anatomy: Dr. R.P. Ellis has focused his attention on studies of bamboo leaf anatomy during the past year. Anatomical material of over 200 species has been acquired and examined. Represented in this sample are world-wide collections of all the tribes of the bambusoid subfamily collected mainly in Central and South America and Asia. These studies have been undertaken in conjunction with the Smithsonian Institution in Washington and have resulted in a revision of the indigenous South African bamboo - Arundinaria tessellata. The co-operative work on the taxonomy and anatomy of the Bambusoideae is being continued.

The anatomy of the South African representatives of genera such as Panicum, Allo-
teropsis, Echinochloa, Eragrostis and Leptochloa has also been concentrated on with the SEM helping considerably in the case of Leptochloa. Anatomical indications are that in all these genera taxonomic problems exist. Collecting expeditions to the Caprivi Zipfel and Natal should help provide convincing anatomical evidence to prove that revisions of all these genera are needed.

Grass identification by epidermal structure for herbivore food preference studies:
The objective of Mrs. R. Botha's research project is the quantification of plant material, in the diet of grazing herbivores. Three grass species are initially being studied viz. Themeda triandra, Eragrostis capensis and Brachiaria serrata.

Preliminary results indicate no clear intraspecific differences between the leaf blades and sheaths of grasses from different geographical areas as regards epidermal anatomical characteristics. Intraspecific differences have been observed between the laminas and sheaths of the species studies. Allowance for these differences must be made in the microscopic identification of grass fragments in rumen or faecal analysis. In vitro digestion studies at this stage indicate no clear differences between specimens of the same grass species collected from different areas but these studies have shown that sheaths are consistently less digestible than the leaf blades.

In a preliminary microscopic investigation of impala rumen samples from Loskop Dam Nature Reserve it was observed that Panicum maximum constituted the most important grass species in their diet.

Cytogenetic studies: Embryo sac studies of several species, such as Lantana camara, Rubus and Anthephora pubescens are being undertaken by Mr. J.J. Spies to determine the degree of sexuality in these species complexes. It has been shown that Lantana camara only reproduces sexually and that sometimes two sexual embryo sacs per ovule are formed. Meiotic data on Lantana camara are being analysed by computer in order to try and establish relationships in this complex.

In addition various crosses between different sorghums are being made in an attempt to determine relationships in the genus Sorghum. An intergeneric hybrid between Aloe and Bulbine is also being studied cytogenetically. (To be continued.)

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