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

BOTANICAL RESEARCH INSTITUTE, PRETORIA

Botanical survey section: Dr. D. Killick and Dr. D. Edwards have compiled a bibliography of Southern African ecology up to 1969, which will appear as a Botanical Survey Memoir.

Dr. Edwards and co-workers are continuing with their work on vegetation studies of conserved areas in South Africa as part of the International Biological Programme.

Mr. P. Müller is continuing his basic research on the stability of basal cover in natural grassland. He and Mr. J.W. Morris have written a paper on his (Müller's) findings which was presented at the East London Congress of the Grassland Society of Southern Africa in 1970.

Messrs. C. Scheepers and J.W. Morris are engaged on a plant-ecological survey of the Highveld Region. Mr. Morris has been working on the western portion of the Highveld Region (Makwassie and Lichtenburg Key Areas). At present he is making an extensive study tour of the U.K., Europe and the U.S.A. to acquire insight into the latest trends and techniques in computer technology, data storage and retrieval and data processing. Mr. Scheepers has been working on the Central and Eastern Highveld Region (Kroonstad and Bethlehem Key Areas). His interest is now being increasingly focussed on the extrapolation phase of the Highveld Survey. He and Mr. Morris have used association-analysis for data processing.

Mr. M. Werger is continuing with his survey of the Orange River Valley, where he is using the methods and procedures of the Braun-Blanquet School of Phytosociology. His field work is now about half completed and he is making good progress.

Mr. N. Jarman is busy investigating the value of Infra-Red Colour, Colour and Panchromatic Aerial Photographs for an air-photo interpretive approach to vegetation survey of grassland in the Eastern Orange Free State (Ficksburg-Clocolan area). He is to use this study for an M.Sc. thesis.

Mr. B. Coetzee is now far advanced in his plant ecological survey of the Jack Scott Nature Reserve near Krugersdorp. This study will also be used for an M.Sc. thesis. He has used association-analysis for data processing, but has subsequently modified the association-analysis hierarchy using a Braun-Blanquet approach. For the latter purpose, he used tables specially designed and constructed for the purpose. These tables represent a combined effort of several members of the Pretoria Botanical Survey Office. A paper is to appear on the subject in *Bothalia* (in press).

Dr. E. Moll is currently engaged on a plant-ecological survey of the Tongaland area of Northern Zululand. This is an area of great interest as it represents the southerly extension of the Mocambique Coastal Plain. He has recently acquired the assistance of a technician, Mr. M. Nel who, while stationed in Pretoria, worked on the distribution of aquatic macrophytes of the Upper Orange River Catchment Area for Dr. Edwards.

Mr. C. Musil has been working on the aquatic-macrophyte ecology of the Pongola Pans in Northern Zululand. He is also using this work for an M.Sc. thesis on which he is making good progress.

At Grootfontein, Mr. J. Acocks is continuing with his immense tasks of revising his "Veld Types of South Africa" and preparing maps for his "Patterns of Plant Distribution."

Now that Mr. H. Taylor has returned from his study-leave in Europe, efforts to unravel the complexities of the fynbos vegetation will be renewed. Meanwhile Mr. C. Boucher is making good progress on his plant-ecological survey of the Kogelberg, where he has been using association-analysis for data processing.

Mr. Boucher has also busied himself in the field of autecology, e.g. on a study of the regeneration of the "Marsh Rose", *Orothamnus zeyheri* (Proteaceae), a species threatened with extinction.

Economic Botany Section

The Economic Botany Section is responsible for:-

1. exploration of the indigenous flora of South Africa for plants of economic potential,
2. botanical research aimed at the control of undesirable plants such as weeds, drug plants and poisonous plants,
3. botanical research in the fields of survival studies and ethno-botany,
4. the botanic garden and the Institute's museum.

The staff of the section consists of two professional officers - Mr. M.J. Wells and Mr. J. Vahrmeijer, and a technical assistant - Mr. J.F. Stephen.

Services or projects receiving attention are as follows:-

- A. The systematic collection of indigenous plants for initial screening for a wide range of economic potentials. This project hinges on a world-wide program to screen plants for anti-tumour activity. We are already co-operating in this program and hope to expand our activities next year, and to send plants for screening for other potentials as well as for anti-tumour activity.
- B. The supply of material of indigenous plants for general research purposes, on request. This request service is being drastically curtailed to enable staff to concentrate on more productive projects such as the previous one. In future only the most strongly motivated requests will be considered.
- C. The provision of an illustrated guide to the identification of the most important toxic plants causing stock poisoning in South Africa. This guide will include 80-100 species, each illustrated by a colour photograph (or photographs where necessary) and/or colour or black and white illustrations to emphasise distinguishing characters. Species descriptions will include useful botanical data, common names, and distribution maps, but no veterinary data. Indexes and lists of species occurring in different regions will be included. Nearly all the photographs for this guide have now been obtained and it is hoped that the guide will be published during 1972/73.
- D. A field identification service in cases of stock poisoning. This service operates at the request of Onderstepoort, and numerous cases of stock poisoning are investigated every year.

E. The establishment and maintenance of a poisonous plant garden. Good progress has been made with this garden, which supplies plants to Onderstepoort for the purpose of training students.

F. Survival studies. Information is continually being gathered for use in compiling survival manuals. Any data, literature or references will be welcomed.

G. Ethno-botanical studies. At present analyses are being made of vegetation from three cave sites: Scotts Cave, Border Cave and a cave in Lesotho.

H. Weed research: a survey of *Opuntia* in South Africa. Over 50 different species and varieties of *Opuntia* have been collected. These are being grown, and herbarium material is being prepared for identification at Kew. Living material of any *Opuntia* spp. will be welcomed. It is extremely important that we should know which *Opuntia* spp. occur in South Africa.

Two of the next projects envisaged are: A survey of plants causing "gousiekte"; and the provision of an illustrated guide to the identification of toxic house and garden plants causing human poisoning, including dermatitis and hay-fever.

Botanical Research Institute investigates computer techniques

As in industry and commerce, there is also a lack of highly trained manpower in science. It seems unlikely that in the foreseeable future this problem will be resolved. In spite of this shortage, increasing demands are made on scientists, who are expected to maintain and expand services. The most potent method by which the demand for better services, without increasing the number of highly trained workers can be met, is by increased efficiency. Modern computer techniques, particularly in the field of data storage and retrieval, hold great promise for increasing efficiency and hence effecting higher productivity. With the rapid advances that are being made in this field overseas, it was considered desirable to send a member of the Institute overseas to investigate ways and means of applying such techniques in research programmes as well as in the collections of the Institute.

Thus, last year Mr. J.W. Morris, our computer expert, who has considerable knowledge of computer techniques as applied to methods of ecological surveying of vegetation, left on an 18 months study tour of the United Kingdom, the Continent and the U.S.A. Mr. Morris will investigate aspects such as data

retrieval from the herbarium, key-forming processes and automated procedures for preparing large, as well as regional floras in addition to ecological computer methods.

(NOTE:- An extremely interesting and stimulating lecture was recently delivered to the N. Tvl. Branch of S.A.A.B. by Dr. A.V. Hall in which many of these techniques were discussed.)

The following is a report recently received from Mr. Morris:

For the past $3\frac{1}{2}$ months Mr. J.W. Morris of the Botanical Research Institute has been studying at the Merlewood Research Station in Lancashire, U.K. Most of his time has been spent studying various aspects of multivariate techniques. He started off with a programmed learning course in matrix algebra which has stood him in good stead through the months. From there he went on to study theoretical aspects of principal components analysis, finding out amongst other things what eigenvalues and eigenvectors really mean in terms a biologist can understand.

This was followed by a one week collecting trip to the Lake District during which 18 woods were visited and 99 plants sampled to obtain data for application of various techniques. The plant collected was *Dryopteris dilatata*, a very variable species, and for each of 249 fronds 36 characters were measured. Means for each plant and for each wood were submitted to a total of five component analyses. Unfortunately the results were rather disappointing as most of the characters were correlated and all the analysis showed was a gradient from "big" to "small" plants. The range of variability did not seem to be correlated with any obvious environmental factor and a lack of time prevented a more detailed study of the problem.

The *Dryopteris* data were then submitted to canonical variates analysis, another multivariate technique. This technique will be extremely useful for certain types of problem - both ecological and taxonomic.

The last technique studied and the one which is potentially the most exciting is trend surface analysis. It was developed by geologists and is based on multiple regression equations. The result of the analysis is a graphic contour map of the area under study showing trends of variation which have then to be interpreted.

DEPARTMENT OF BOTANY AND MICROBIOLOGY, RHODES UNIVERSITY: The Department of Botany and Microbiology had an eventful year in 1971. In May, Dr. S. Tim left to emigrate to Canada. In July, Dr. Charles M. Breen returned from a sabbatical year at the University of Indiana, Bloomington and has recently accepted a Senior Lectureship at the University of Natal, Pietermaritzburg. He studied techniques in culturing fresh water algae and worked on aspects of sexual reproduction in *Volvox*. Mr. M.A. Meyer left the department in August to further his studies in education. Dr. P. Saenger spent 15 months in the department and has now left for a wander-year in Europe.

Dr. D.R. Woods has been promoted to a Professorship in the department. Mr. D. Hasses of the Pineapple Research Unit, has left the department in December to become a pharmacist; his position has been taken over by Mr. W. Fowler.

Overseas visitors to the department during 1971 have included Dr. Stafleu, Professor and Mrs. Faagri, Professor Egle and Professor Schwabe.

Dr. Margaret Martin, who was formerly on the staff, stayed a few months in Grahamstown, renewing old friendships and, on several occasions collected seaweeds with Dr. M.A. Pocock.

Miss Jennifer A. Thomson has been awarded the Shell Research Fellowship of R4 000 per annum.

A second and very successful Microbial Genetics vacation course was held in the department early in December.

Two important floras - The Flora of Lesotho by Dr. A. Jacot Guillarmod, and Eastern Cape Veld Flowers by Dr. E.E.A. Gledhill - have been published.

Numerous papers on a variety of topics have emanated from the staff and post-graduate students in the department as can be seen from the list appended below:

Tim, S. K-M. 1971. Developmental morphology of a new Loculoascomycete on *Euphorbia*. J1 S. Afr. Bot. 37(3): 157-168.

Tim, S. K-M; 1971. The morphology and development of *Tripospora tripos* (Cooke) Lindau. Ann. Bot. 35: 713-720.

Tim, S. K-M; & E.S. Twyman 1971. The morphology and development of *Antennularia engeliana* (P. Henn.) v. Höhn. J1 S. Afr. Bot. 37(3): 147-156.

- Tim, S. K-M. & E.S. Twyman 1971. Morphology and development of *Aphysa rhynchosia*. Trans. Br. mycol. Soc. 56(3): 435-442.
- Seagrief, S.C. 1971. Seaweeds. The Eastern Cape Naturalist, No. 44: 9-15.
- Jacot Guillarmod, A. late 1970. Aquatic weeds in southern Africa. Probe. (Science Students Council Journal, Univ. of the Witwatersrand).
- Jacot Guillarmod, A. 1971. The Flora of Lesotho. Book - 474 pp + end maps. Pub. J. Cramer, Germany.
- Breen, C.M. 1971. An account of the Plant Ecology of the Dune Forest in the vicinity of Lake Sibayi. Trans. roy. Soc. S. Afr., 39: 229-234.
- Breen, C.M. & I.D. Jones 1971. A preliminary list of Angiosperms collected in the vicinity of Lake Sibayi. Trans. roy. Soc. S. Afr. 39: 235-245.
- *Saenger, P. 1970. Secondary cortex formation in *Osmundaria prolifera* (Amansieae: Rhodomelaceae). Helgoländer wiss. Meeresunters. 21: 305-309.
- *Saenger, P. & Sophie C. Ducker 1971. The morphology and development of *Lenormandia prolifera* (C. Ag.) J. Agardh (Amansieae, Rhodomelaceae). Aust. J. Bot. 19: 51-62.
- *Saenger, P., Sophie C. Ducker & K.S. Rowan 1971. Two species of Ceramiales from Australia and New Zealand. Phycologia 10(1): 105-111.
- Saenger, P. 1971. On the occurrence of *Ophidocladus* (Rhodomelaceae) in southern Africa. J1 S. Afr. Bot. (in press).
- Saenger, P. 1971. Additions and comments on the Rhodomelaceae of Inhaca Island, Mozambique. (Ready for publication).
- Saenger, P. 1971. A rapid method for the spectrophotometric determination of bromine in sea water and marine algae. (Ready for publication).
- * denotes work commenced elsewhere but completed at Rhodes University.
- Jessop, J.P. 1970. Studies in the bulbous Liliaceae ... 1. *Scilla*, *Schizocarpus* and *Ledebouria*. J1 S. Afr. Bot. 36: 233-266.
- Gledhill, E.E.A. 1971. Eastern Cape Veld Flowers. Book - 271 pp, 64 plates (black and white), 4 plates (colour). Pub. Cape Department of Nature Conservation, Cape Town.
- Hendry, D.A., D.R. Cooper & D.R. Woods 1971. The microbiology of curing and tanning processes. Iv.- The laboratory screening of antiseptics. J. Amer. Leather Chem. Assoc. 66: 31.
- Woods, D.R., T. Mosman, Sally Hanson & D.A. Hendry 1971. Pigmentation and acriflavine resistance in *Serratia marcescens*. J. Bact. 108: 765-770.

- Woods, D.R. 1970. The mechanism and evolution of transferable drug resistance in bacteria. Proc. Transkei & Ciskei Research Soc. 16-17.
- Woods, D.R. & D.A. Hendry 1971. Killer factors in yeast, *Saccharomyces cerevisiae*. Proc. 4th Congr. S.A. Genet. Soc. 61.
- Woods, D.R., O. F. Sparrow, T.R. Mosmann & D.A. Hendry 1971. Induction of resistance and pigmentation mutations by acriflavine in *Serratia marcescens*. Proc. 4th Congr. S.A. Genet. Soc. 66-68.
- Woods, D.R., R.L. Welton, D.R. Cooper & Martha F. Hendry 1971. Tanning trial with Australian and New Zealand wet-salted hides. Part II. Bacteriological Analysis. 555.
- Cooper, D.R., Martha F. Hendry & D.R. Woods 1971. Microbiology of curing and tanning processes. Part 9. The effect of pH on aerobic hide bacteria. 560.
- Cooper, D.R., A.C. Galloway & D.R. Woods 1971. Microbiology of curing and tanning processes. Part 10. The effect of sampling position on the aerobic bacterial content of wet-salted hides. 568.
- Welton, R.L., D.R. Woods & Jennifer A. Thomson 1971. A method for the determination of collagenolytic activity of bacteria from hides. 572.
- Thomson, Jennifer A., D.R. Woods & R.L. Welton 1971. The incidence of aerobic helophiles with collagenolytic activity. 573.

PROFESSOR R.T. COUPLAND of the Department of Plant Ecology, University of Saskatchewan, Canada, and Chairman of the Grassland Working Group of the IBP, visited the Transvaal for a week early in January. He held discussions with some members of the IBP National Committee and visited research stations of the Department of Agricultural Technical Services. Dr. Coupland gave a lecture on the vast Canadian IBP Grassland project at Matador, in which a complete systems analysis is being undertaken. The research phase is complete and two years will be spent processing the data.

PROFESSOR JAMES F. SUTCLIFFE of the Department of Biological Sciences of the University of Sussex, Great Britain, will be visiting the Republic as a British Council visitor from 22nd January to the end of March. He will visit most universities and will be giving lectures at most centres.

S.A.G.P. (ORANJE VRYSTAAT):- Die tak het tans 14 lede waaronder die Dept. van Natuurbewaring van die O.V.S.; die Landboukollege te Glen en die Departement Weidingsleer, Mikrobiologie en Gentika van die Landboufakulteit van die U.O.V.S. verteenwoordig is. Die bestuur bestaan tans uit Professor E.M. van Zinderen Bakker (Voorsitter); Professor B.R. Roberts (Onder-voorsitter); Dr. J.A. Coetzee (Penningmeester) en Dr. J.N. Eloff (Sekretaris).

Sedert die stigting in Julie het die tak drie gewone vergaderings en twee buitengewone vergaderings gehou.

Die volgende persone het as sprekers opgetree oor onderwerpe wat gewoonlik navorsingsresultate behels het:

10 Augustus 1971 - Mnr. W.J. van Rensburg - Groeiereserwes by Weiplante.

- Prof. E.M. van Zinderen Bakker - Probleme van die paleoëkologie van die Kaap tydens die Kwartêr.

7 September 1971 - Mnr. J.U. Grobbelaar - 'n Kritiese ondersoek na metodes vir die bepaling van primêre produksie.

Prof. E.M. van Zinderen Bakker - Navorsingsresultate behaal by die Nelsonbaai Grot en in die Sahara met betrekking tot paleoklimatologie.

17 September 1971 - Prof. Karl W. Butzer van Chicago - "Some problems of geomorphology in arid and semi-arid areas".

15 Oktober 1971 - Prof. Knut Faegri van Bergen - "Pollination Ecology".

25 Oktober 1971 - Dr. J.A. Coetzee - 'n Oorsig van die struktuur van die fotosintese-apparaat in die planteryk.

Prof. B.R. Robberts - Plantekologie van die Oxbow-gebied.

Die vergaderings is normaalweg onderbreek of afgesluit deur die bediening van tee en verversings en is in die Plantkunde-gebou van die U.O.V.S. gehou.

Daar was gemiddeld 12 lede en 19 besoekers, van wie die meeste studente was, teenwoordig by die vergaderings wat tot dusver gehou is.

S.A.A.B., EASTERN CAPE SECTION: Two meetings of this section have taken place at Fort Hare University; the first, a lecture by Dr. D. Woods on microbial genetics was in September and the second, by Dr. S. Seagrief on seaweeds was given in October.

Lectures given locally by Prof. K. Faegri and Prof. F. Stafleu, were enjoyed by many people other than members and Prof. K. Egle had a large number of botanists present at his lecture given mainly for biochemists. The branch members entertained the latter two speakers at a luncheon, while Prof. Faegri and his wife were taken to see some of the local flora. Visits like these from overseas experts are of great value to such places as Port Elizabeth, Grahamstown and Alice.

Dr. P.J. Robbertse of the University of Port Elizabeth has been appointed Assistant Professor at Pretoria University, and, though he will be missed, he goes with all good wishes from the Eastern Cape to his new post.

Mr. Derek Ott, till now a student member, has been appointed as biology master at Muir College, Uitenhage. He will therefore continue to belong to this branch, fortunately.

A conference on microbial genetics and molecular biology was held during the last part of November and early December at Rhodes University. It was run by Dr. D. Woods and Mr. D. Hendry of the Department of Botany and Microbiology, and attended by many from all over South Africa, all of whom took part in the practical work involved as well as attending the numerous lectures.

News of other members of the section can be found under the report for Rhodes University.

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