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About the Institute

The Hunt Institute for Botanical Documentation, a research division of Carnegie Mellon University, specializes in the history of botany and all aspects of plant science and serves the international scientific community through research and documentation. To this end, the Institute acquires and maintains authoritative collections of books, plant images, manuscripts, portraits and data files, and provides publications and other modes of information service. The Institute meets the reference needs of botanists, biologists, historians, conservationists, librarians, bibliographers and the public at large, especially those concerned with any aspect of the North American flora.

Hunt Institute was dedicated in 1961 as the Rachel McMasters Miller Hunt Botanical Library, an international center for bibliographical research and service in the interests of botany and horticulture, as well as a center for the study of all aspects of the history of the plant sciences. By 1971 the Library's activities had so diversified that the name was changed to Hunt Institute for Botanical Documentation. Growth in collections and research projects led to the establishment of four programmatic departments: Archives, Art, Bibliography and the Library.

UNIVERSITY OF COLORADO
DEPARTMENT OF PERSONNEL
BOULDER, COLORADO 80309

Willard Administrative Center 67

MEMORANDUM

September 30, 1976

TO: Deans, Directors, Department Heads, and Department Secretaries
Boulder Campus

FROM: Philip Becker, Manager of Personnel Services

SUBJECT: 1977 Holiday Schedule

This year, through your suggestions, we are providing not only the 1977 University holidays but the balance of 1976 and New Year's 1978. We hope this format will help you in planning your holidays to receive full enjoyment from them.

1976 Holiday Balance

Thursday, November 25
Friday, November 26
Friday, December 24

Thanksgiving Day
Day after Thanksgiving
Day before Christmas

Replaces

Colorado Day
Christmas Day

1977 Holidays

Friday, December 31 (1976)
Friday, March 25
Monday, May 30
Monday, July 4
Monday, September 5
Thursday, November 24
Friday, November 25
Friday, December 23
Monday, December 26

Day before New Year's
Last Day of Spring Break
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Day after Thanksgiving
Friday before Christmas
Day after Christmas

Replaces

New Year's Day
Lincoln's Birthday

Colorado Day
Veteran's Day
Christmas Day

1978 Preview

Monday, January 2

Day after New Year's

Replaces

New Year's Day

(continued on back)



Two (2) floating holidays are available in 1977. They replace Washington's Birthday (February) and Columbus Day (October).

Floating holidays may be taken in advance of the day observation would have taken place; however, should you leave the University before the day the observation would have taken place, the day advanced would have to be deducted from the last pay check.

Holiday Leave (Floating holidays) are to be taken in the same fiscal year or within 75 days after the end of the fiscal year or the employee shall be paid in cash.

If you have any additional questions, please contact Personnel Services, extension 8066.

PB/dp

David J. Rogers
Prof. of Biology-EPO
Taxinetrics, Director
Ramaley 110



ROYAL BOTANIC GARDENS
Kew, RICHMOND, Surrey
Telegrams: Kewgar, Richmond, Surrey
Telephone: 01-940 1171

Please address any reply to
THE DIRECTOR
and quote: QG.1298
Your Reference:

27 September 1976

Dr David J Rogers
Taximetrics Laboratory
1229 University Avenue
University of Colorado
BOULDER,
Colorado 80309

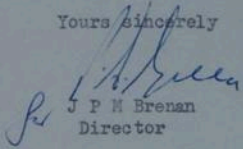
Dear Dr Rogers

Thank you for your letter of 4. September in reply to our
query about two matters relating to Manihot.

I note that you will be away on your travels until
December but after this would be willing to identify our
unverified tropical American Manihot specimens. We
therefore plan to send them to you in a month or two's
time and with them we will despatch the material we have
here of the varieties described by Prain.

With many thanks,

Yours sincerely


J P M Brennan
Director

DC



The University of Birmingham

DEPARTMENT OF PLANT BIOLOGY

The University of Birmingham, P.O. Box 363, Birmingham B15 2TT
Telephone 021-472 1301

Mason Professor of Botany: J G Hawkes Sc D

JGH/SED

24th September 1976

Dr. D. Rogers,
Department of Environmental Population and Organismic Biology,
University of Colorado,
Boulder,
Colorado 80302,
U.S.A.

Dear Dave,

When I wrote to you recently there was yet another matter which I meant to mention but unfortunately forgot. This is as follows:

Whilst I was at Radzikow in Poland, Dr. Kulpa, who is in charge of the gene bank, asked my advice about the suitability of the institute computer for dealing with genetic resources data. Since I am not an expert I said I would try and get an opinion from you. They have a "Compucorp 445 Statistician" which cost them \$40,000 and which accommodates 38,000 bites on each disc. They have another machine of the same size. The gene bank totals some 25,000 collections and they would be using about 25 descriptors for each accession, of which each descriptor would have about ten descriptor states. At present they are using the thesaurus prepared in Prague for the Comecon group which they call "Classifier". Varieties of these Classifiers have been made, i.e. for wheat in 1975 and for oats in 1974 as well as many others. I wondered whether you knew of the existence of these and felt sure that you must have come across them when you attended the wheat symposium in Leningrad. I brought a copy of one of them back with me and if you have not seen any of them I should be happy to send you a xeroxed copy.

If you could let me know please whether you think this "Compucorp 445 Statistician" will be suitable for storing genetic resources data using the GR/CIDS system I will be happy to know about this. It looks a terribly small machine and it seems to me that it may not be suitable. It was bought in the United States so I expect you know it well.

With best wishes,

Yours ever,

Jach

Professor J.G. Hawkes

*file
Misc.*

September 24, 1976

Dr. O. N. Agusiobo
Ag. Head
Dept. of Vocational Education
University of Nigeria
Nsukka Campus
Nsukka, Nigeria

Dear Dr. Agusiobo:

I have forwarded your letter to the President of Colorado State University at Fort Collins, Colorado, where a program similar to that one in which you are interested may be found. I trust that you will find success in Ft. Collins (which is 60 miles from Denver). We have no program of interest to you at this University.

Sincerely yours,

David J. Rogers
Professor of Biology

DR:rs

Enclosure

file

September 24, 1976

Dr. Ray Chamberlain
President
Colorado State University
Ft. Collins, CO 80521

Dear Ray:

I enclose a letter sent to me from Nigeria. Since I know of no programs here that satisfy the description given in the letter, I wonder if you have any suggestions for work by the application there.

Sorry to bother you with such details, but I hope that you can pass it along to some suitable department there.

Sincerely yours,

David J. Rogers
Professor of Biology

DR:rs

Enclosure

file
BOGOR

September 24, 1976

Dr. Setijati Sastrapradja, Director
Lembaga Ilmu Pengetahuan Indonesia
Lembaga Biologi Nasional
(National Biological Institute)
Jalan Ir. H. Juanda 11
P.O. Box 110
Bogor, Indonesia

Dear Dr. Sastrapradja:

Following your letter of September 14 (#2078/IA/lb/76.-), I do not think that I will be able to come to Bogor, although it would be very pleasant to visit with you.

Since my travel to Japan and other countries is supported by the International Business Machines Corporation, I am not free to alter my schedule to coincide with the meeting in Los Banos.

I have submitted my resignation as Director of the GRICIDS Program for the International Board of Plant Genetic Resources. It has been a pleasure to know you.

Sincerely yours,

David J. Rogers
Professor of Biology

DR:rs

file
September 24, 1976

BY POUCH

Mr. Robert Pichel, Chief
AGPE, Crop Ecology and
Genetic Resources Unit
UN/FAO
Rome, Italy

Dear Bob:

This is to inform you that I have submitted a letter of resignation as Director of the GRCIDS Program to be effective at the end of this contract year.

Sincerely yours,

David J. Rogers
Professor of Biology

DR:rs

September 24, 1976

Professor A. H. Bunting
Dept. of Agricultural
Development Overseas
Reading University
Reading, England

Dear Hugh:

The following is a painful letter to write, but it is necessary. I enclose two papers that have been sent: one a letter to Dick; the other a statement made to the invited individuals, listed at the top, who are Professors at the University.

As explained in the letter to Dick, I have not been able to find any real connection between the required work for the international community and the activities that could be considered as justifiable at the University of Colorado. I trust that you will understand my desire and interests. Accept my apologies; that is, having "stirred the soup" and then dropping the matter. As I indicated, I will return to being a Professor in the Department of EPO Biology where I hope to serve usefully as a taxonomist.

It has been a pleasure to work with you and I am sorry that I could not forge a program of some use. However, the international community is too big, too diverse, for me to do any powerful and useful things in. Please give my regards to your colleagues there.

Sincerely yours,

David J. Rogers
Professor of Biology

DR:rs

Enclosures 2

September 24, 1976

Professor A. H. Bunting
Dept. of Agricultural
Development Overseas
Reading University
Reading, England

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David J. Rogers
Professor of Biology

DR:rs

Enclosures 2

September 24, 1976

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Reading University
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Sincerely yours,

David J. Rogers
Professor of Biology

DR:rs

Enclosures 2

out

September 24, 1976

Mr. Richard H. Demuth
Surrey, Karasik & Morse
1156 15th Street, NW
Washington, DC 20005

Dear Dick:

After doing considerable soul-searching, I come to the conclusion that I must resign from the work for the IBPGR at the end of this contract; and leave to your decision what road to follow with respect to work done here.

The reasons are as follows: For three years I have been almost totally involved in the work for data management of genetic resources in the international community. I think that the objective of that time was to discover the needs for such data management, and I believe these needs have been identified. Further, the work that remains, in a technical sense, can be done with not much more effort; and that effort does not involve my expertise. What needs to be done is more in the area of either political or diplomatic activities, convincing various individuals and agencies that they should cooperate in the international data network for the purposes of data gathering, storing, and sharing of those data that define genetic resources in the way that the Board desires. I do not think that such activity is mine to perform.

At the meeting of the Advisory Committee, we were admonished to carry out further study, to communicate better, and to find a means by which we can get more commitment and involvement from the University of Colorado. We have started to do this, but I have told the assembled committee that there is little interest in academic programs by the international community, and that I have yet to make a match between the requirements from the international community and the University. This being the case, and further that I have not done any scientific work or good teaching in the last three years, it seems that I must do what I must - admit my completion of work for the IBPGR, and return to that which I can do best.

Thank you for your many kindnesses over the past three years. I wish you well in the heavy task still confronting the Board, namely the primary mission of assembling and keeping the important germ plasm of the world.

Sincerely yours,

David J. Rogers
Professor of Biology

DR:rs

September 24, 1976

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1156 15th Street, NW
Washington, DC 20005

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Sincerely yours,

David J. Rogers
Professor of Biology

DR:rs

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
NATIONAL PROGRAM STAFF

Plant and Entomological Sciences
Beltsville, Maryland 20705

September 23, 1976

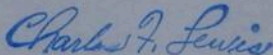
Mr. Gilbert N. Hersh
Associate Director, Planning/Administration
Genetics Resources Program
Biology Department
University of Colorado
Boulder, CO 80302

Dear Mr. Hersh:

On behalf of the National Plant Genetics Resources Board, I want to thank you for your discussing the development of a computer-based system for storing, retrieving, and analyzing data on plant genetic resources, at our meeting September 9. I am sure the Board has a much better understanding of your relationship to the IPGRE and to DSAD, ARS.

A draft report is enclosed. Please make any additions or changes and return it to me. When the final version is issued, I will be pleased to send you as many copies as you need.

Sincerely,



Charles F. Lewis
Executive Secretary
National Plant Genetics Resources Board

Enclosure

✓ cc: Dr. D. J. Rogers

Report of Second Meeting
National Plant Genetics Resources Board
Washington, D.C.
September 9, 1976

The National Plant Genetics Resources Board meeting was called to order at 9:00 a.m., by Chairman, R. W. Long, Assistant Secretary, Conservation, Research, and Education, U.S.D.A.

All members of the Board were present except Dr. Sterling Wortman.

The report of the meeting of the Board held on April 15, 1976 was approved as written. The Executive Secretary said that all 13 persons contacted to write germplasm status reports had accepted the assignment. The reports are due by January 1, 1977. Dr. Charles Rick has completed the report for tomatoes. Mr. Long said that the first meeting was primarily for members to become acquainted and to consider objectives of the Board. The Board would now start working to achieve those objectives.

The 17 guests in attendance and members of the Board introduced themselves.

Secretary Butz attended the Board meeting for part of the morning session. The Secretary said he thought agricultural production was the major problem for the future and that he recognized the importance of research in contributing to production efficiency. He indicated some budget increases for research had been recommended in the face of restraints on the Federal budget and the huge sums required to support the food stamp program.

Mr. Richard H. Demuth, a lawyer with the firm of Surrey, Karasik and Morse, Washington, D.C., and Chairman of the International Board for Plant Genetic Resources, spoke about the organization and objectives of the IBPGR. The Board was formed in 1973 by the Consultative Group on International Agricultural Research, of which the Food and Agriculture Organization of the United Nations (FAO), the World Bank, and the United Nations Development Programme are sponsors. The IBPGR is headquartered in FAO, Rome. Its basic purpose is to promote and coordinate international, regional, and national actions to collect, evaluate, preserve and utilize the world's reserves of plant genetic resources. Priorities are as set forth in their publication "Priorities Among Crops and Regions", AGPE:IBPGR/76/8, April 1976. They have organized several germplasm advisory committees and hope to stimulate collection and documentation and make information available to breeders throughout the world. Mr. Demuth reported two new regional centers at Turrialba and Ethiopia will be in operation in 1977. IPGRB supports a training center, primarily for underdeveloped countries, in Birmingham, UK. They are supporting the development of a computer-based system through a contract with the Genetic Resources Program, University of Colorado, Boulder. Mr. Demuth stressed the desire for close cooperation between IPGRB and NPGRB.

Dr. John Creech, Director, U.S. National Arboretum, a member of the IPGRB, spoke briefly of the importance of U.S. in the movement of germplasm,

especially as a 3rd country distributor for exotic germplasm, such as coffee and banana.

Dr. Robinson asked Mr. Demuth if IPGRB monitored international germplasm centers. He said they did not but worked in an advisory capacity.

International centers are subject to a tremendous amount of inspection from various organizations and most are thoroughly reviewed every 5 years.

In the discussion after Mr. Demuth's presentation the following points were stressed: (1) Adequacy of international centers as environmentally and politically secure repositories, (2) desirability of the U.S. National Seed Storage Laboratory, Ft. Collins, CO, accepting some germplasm from international centers as insurance against catastrophic losses, (3) expense of regrowing materials, (4) population size for regrowth, and (5) quarantine regulations.

Mr. Gilbert N. Hersh, Associate Director, Planning/Administration, Genetic Resources Program at the University of Colorado at Boulder, introduced himself as a systems scientist. He also introduced Dr. D. J. Rogers, Director of the Genetics Resources Program; and Roger Smith and Richard J. Sooy, Data Systems Application Division (DSAD), ARS, U.S.D.A. Mr. Hersh discussed the contract with ARS whereby his laboratory and DSAD are cooperating in a feasibility study for a computer assisted program for recording and retrieving information on germplasm.

He reported enthusiastic cooperation from scientists interviewed so far, but stressed that lack of funds and personnel changes made a systematic system of data handling necessary.

Dr. Lewis said he hoped the Board would consider its range of interest to extend from the collection of exotic stocks to the release and maintenance of improved cultivars. Such a program would include, 1) collection, maintenance, preliminary evaluation, documentation, and distribution of germplasm, 2) taxonomic and cytological understanding of the collected materials, 3) advanced screening and evaluating of materials by user scientists from many disciplines, 4) inheritance studies of desirable characters, 5) developmental breeding or assembly of characters into reasonably good agronomic or horticultural types, and 6) applied breeding. This task is shared by State, Federal, and private interests, and if, as a nation, all elements of the program were operating, a gene flow would be established from exotic stocks to cultivars. This would be the best defense against genetic vulnerability, and also serve to increase production efficiency and quality of farm commodities.

Dr. Sprague stressed that support for these traditional approaches to the utilization of plant genetic resources was declining as a result of budget restrictions and higher priority being given to more glamorous new approaches. He suggested that traditional approaches would continue to make valuable contributions and should not be neglected in the justified

zeal to move ahead with tissue culture, somatic hybridization, genetic transformation, and other basic approaches.

Dr. Gardner discussed the need for a tropical research facility. Pros and cons of various sites were discussed but no action was taken.

Mr. Edminster mentioned that the Alaska Plant Materials Center would like to be curator of plants for the Arctic region. The Board encouraged this development.

Dr. Brown presided during the afternoon session in the absence of Mr. Long.

Dr. Gabelman lead a discussion on need for improved organization and funding for training in germplasm biology. Support for graduate students and research grants to institutions is weak. There is apparently no good estimate of the kinds of trained personnel needed to meet national and international requirements in the future.

Dr. Loden thought that full use was not being made of germplasm already in collections. All Board members contributed to discussion and stressed that, 1) data is not readily available on what is in storage, 2) exotic germplasm is often poorly adapted and needs to be converted or improved, 3) user scientists often do not report their data to curators of germplasm, and 4) need for more screening and evaluation by user scientists including entomologists, pathologists, nematologists, physiologists, nutritionists, market quality experts, soil scientists, and engineers.

The Board decided to write an interim document for presentation to the Secretary of Agriculture containing statements and recommendations regarding plant genetic resources and their utilization. First draft writing assignments were made for the document as follows, with the understanding that any Board member may contribute to any of the topics.

I. The broad problem - C. F. Lewis

H. D. Loden

II. Current status, relative to:

Collection

Assembly

Storage

Maintenance

Documentation

Distribution

(Assignments were made by the Board in May; reports are due by January 1, 1977)

III. Recommendations based on analysis of reports (II above) due

January 1 January 1, 1977 - The Board

IV. Screening and evaluation - D. C. Peters

G. F. Sprague

V. Commodity committees - G. F. Sprague

C. F. Lewis

A. Utilization

B. Appropriate breeding procedures

VI. Personnel requirements - W. H. Gabelman

C. M. Rick

The Board intends to carry out that proposal of the ARPAC Special Report, "Recommended Actions and Policies for Minimizing the Genetic Vulnerability of our Major Crops", which calls for the establishment of a committee of genetic resource experts for each crop or group of crops.

"Among the duties of the commodity committees will be:

- " 1. Assess the materials already assembled and the status of their maintenance and availability; outline procedures for filling any gaps; and make recommendations concerning maintenance of germplasm.
- " 2. Make recommendations for use and systematic exploitation of the collections in breeding programs.
- " 3. Suggest basic research programs designed to develop information for use in applied techniques for achieving the greatest benefits from the available germplasm."

Board members were asked to send their recommendations on (1) committees needed, (2) suggested membership of committees, to C. F. Lewis. Final decisions would be made by the Board. The Board would utilize existing committees as much as possible.

It was the consensus of members that the next meeting should be held early in January, 1977.

Meeting adjourned at 5 p.m.

Membership list and agenda are attached.

2 Enclosures

AGENDA

NATIONAL PLANT GENETICS RESOURCES BOARD
9:00 a.m., September 9, 1976
Room 3109, South Building, U.S.D.A.
Washington, D.C.

Presiding Chairman

- Robert W. Long
Assistant Secretary of Agriculture
Conservation, Research & Education

Reports to Board:

International Plant Genetics
Resources Board

- Richard Demuth
Chairman, IPGRB

Genetic Resources Communication,
Information and Documentation
System

- Gilbert N. Hersh
Taximetric Laboratory
University of Colorado

Deliberations of Board

Documents of special interest to
NPGRB, particularly "Recommended
Actions and Policies for Mini-
mizing Genetic Vulnerability of
our Major Crops.

Tropical facility for maintaining
and utilizing plant genetic resources.

Organization and funding for research
and training

Other

MEMBERSHIP
OF
NATIONAL PLANT GENETICS RESOURCES BOARD

CHAIRMAN

Robert W. Long, Assistant Secretary
Conservation, Research and Education
U.S. Department of Agriculture
Washington, DC 20250
(202) 447 2796

EXECUTIVE SECRETARY

C. F. Lewis, Staff Scientist
Plant Genetics and Breeding
National Program Staff, ARS
U.S. Department of Agriculture
Beltsville, MD 20705
(301) 344 3884

MEMBERS

Dr. D. F. Beard
Vice President-Research
Waterman-Loomis Company
10916 Bornedale Drive
Adelphi, MD 20783
(301) 937-6449

Dr. William L. Brown
President, Pioneer Hi-Bred
International, Inc.
1206 Mulberry Street
Des Moines, Iowa 50309
(515) 245 3587

Dr. Paul J. Fitzgerald
Associate Deputy Administrator
North Central Region - ARS
U.S. Department of Agriculture
2000 W. Pioneer Parkway
Peoria, IL 61615
(309) 360 7175

Dr. W. H. Gabelman
Department of Horticulture
University of Wisconsin-Madison
Madison, WI 53706
(608) 262 1490

Dr. Charles O. Gardner
Meyer Katzman Professor of
Agronomy
Department of Agronomy
The University of Nebraska-Lincoln
Lincoln, NE 68583
(402) 472 2811

Dr. Harold D. Loden
Executive Vice President
American Seed Trade Association
1030 15th Street, N.W.
Washington, DC 20005
(202) 223-4080

Dr. Don C. Peters
Professor and Head, Department of
Entomology
Oklahoma State University
Stillwater, OK 74074
(405) 372 6211, ext. 7055

Dr. Charles M. Rick
Professor and Geneticist
Department of Vegetable Crops
University of California
Davis, CA 95616
(916) 752 1737

Dr. H. F. Robinson
Chancellor, Western Carolina University
Cullowhee, NC 28723
(704) 293 9701

Dr. G. F. Sprague
Professor, Plant Breeding and Genetics
Department of Agronomy
University of Illinois
Urbana, IL 61801
(217) 333 4254

Dr. Sterling Wortman
Vice President, The Rockefeller
Foundation
1133 Avenue of the Americas
New York, NY 10036
(212) 869 8500

26/9/76.

Dear Dave,

I feel I should write to you, briefly and in confidence.

It was most unfortunate that you were not at last week's wheat germplasm committee meeting. From its results you may realise that the situation is changing.

First, at top level the organisation's new management is flexing its muscles. Whatever official results this will have are unknown although rumours proliferate! Second, at local level a late summer offensive has been launched by the editor and latest recruit - your programme is obviously one of its targets; my 'western' presence is probably another.

I expect that you will get a verbal report of the meeting from Joe. C. Some of the innuendos of the written script may have been too subtle for German speakers to appreciate. However the legal mind of others will undoubtedly comprehend their implication.

In my view, it is essential that some Boulder representation be at the next Executive (Nov. 17 & 19). You may know more than I of current developments there but several critical decisions (policy, financial and programme-wise) are likely to be taken at the November meeting.

Best wishes, and to Connie,

Yours sincerely, Trevor

September 21, 1976

Mr. Mugh Mackay
Harper and Row, Publishers, Inc.
345 So. Lincoln Drive
Troy, Mo. 63379

Dear Mr. Mackay:

Would you please tell me if you are the right individual in Harper and Row with whom to discuss a possible book that I wish to write? If so, please let me know when you or one of your representatives who might be interested will be in Boulder.

I intend to prepare a book with two other authors on the subject of computers and data management in biology, and hope that such a topic is of concern and interest to Harper and Row.

Sincerely yours,

David J. Rogers
Professor

DJR:js

Hand file
Student Adviser
Garrido, Pedro

September 20, 1976

Mr. T. Ilosvay, Chief
Field Staff Recruitment and
Administration Division
Cooperation for Development and
External Relations Sector
UNESCO
7, place de Fontenoy, 75700
Paris, France

Dear Mr. Ilosvay:

Reference: CPX/RAD/1/C.76/1153

You ask me to write to support the application of Sr. Pedro Garrido for a post in Guinea Ecuatorial. I am pleased to recommend Sr. Garrido, as he was a student of mine here at the University of Colorado, and received his guidance in research under my direction.

1. Technical Competence. Sr. Garrido has worked in many areas of biological science, and has specialized in systematic botany. His studies in the University of Colorado covered various subjects such as population biology, genetics, computer-aided classification, numerical taxonomy and taximetrics. He was outstanding in these subjects among the students here. His own research exhibited good design and outstanding accomplishment. He rates highly in technical competence.

2. Suitability for employment in the country specified. Sr. Garrido is very amenable to work with others, and is good in collaborative efforts. I have had the opportunity to observe him working with scientific colleagues in a most productive manner. His personality is such that he can readily adapt to a variety of circumstances and continue to be productive.

3. Integrity and personality. I was privileged to have a student whose scientific honesty is of the highest order. I would have no qualms to share with him any type of information that might be sensitive

or restricted, because Sr. Garrido would respect that confidence. Personally, he is somewhat retiring, but he does not fail to respond or act when the occasion demands. I think his personal "diplomacy" is outstanding, and I am certain that UNESCO would be greatly benefited by having this man as a member representing them.

Overall, you have an outstanding candidate; and one whom I am pleased to recommend highly.

Sincerely yours,

David J. Rogers
Director

DR:rs



united nations educational, scientific and cultural organization
organisation des nations unies pour l'éducation, la science et la culture

7, place de Fontenoy, 75700 Paris

"Confidential"

téléphone : 577-16-10
cables : Unesco Paris
téléc. : 270602 Paris
204461 Paris

référence : CPX/RAD/1/C.76/1153
(to be quoted in your reply)

16 August 1976

Post:DC/EQG/71/501/ED/008

Dear Sir,

Mr. Pedro M. GARRIDO LAGUNILLA

... has given your name as a reference in connexion with an application for employment by Unesco. The candidate is under consideration for the above-mentioned post of which I attach a summary description of the main duties and responsibilities.

I should be grateful to have your opinion on the following concerning this candidate:

1. Technical competence for the assignment;
2. Suitability for employment in the country specified, with particular reference to the ability to work in a team and to get along with people of other nationalities;
3. Integrity and personality.

Any information you feel able to give me will be considered strictly confidential. Would you kindly send your reply to me, marking your envelope "Confidential".

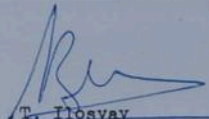
I shall be very grateful for your co-operation in this matter.

Enclosure:

Yours faithfully,

a job description

Mr. David J. Rogers
Taximetrics Laboratory
University of Colorado
BOULDER, Co.80302
(U.S.A.)


T. Hovsøy
Chief
Field Staff Recruitment and
Administration Division
Co-operation for Development and
External Relations Sector

UNESCO

PUESTO DEL PROGRAMA DE LAS NACIONES UNIDAS PARA EL DESARROLLO

1. Título del puesto: Especialista en la Enseñanza de la Biología, (P.4).
2. Lugar de trabajo: Centro de Desarrollo de la Educación, Bata, Guinea Ecuatorial.
3. Antecedentes: Véase el anexo.
4. Funciones:
El especialista en la enseñanza de la biología trabajará bajo la dirección del experto principal del proyecto. Sus principales funciones serán:
 - a) asistir las autoridades en vista del desarrollo en la enseñanza primaria y en los dos primeros grados de la enseñanza media del estudio del medio ambiente;
 - b) impartir la enseñanza de la biología así como de las ciencias naturales al nivel de la formación docente;
 - c) cooperar estrechamente con los profesores de las diversas asignaturas a fin de desarrollar la relación de la enseñanza con el medio ambiente;
 - d) estudiar, en colaboración con el especialista en agronomía, la posible utilización de las actividades agrícolas escolares como centro de interés para el estudio del medio ambiente;
 - e) participar en los trabajos de reforma en todos los niveles y preparar programas y documentación escolar en su especialidad;
 - f) participar a los seminarios, coloquios y estudios en el Centro de Desarrollo de la Educación;
 - g) encargarse de la formación de sus colaboradores y homólogos en su especialidad;
 - h) preparar, redactar y colaborar a la reproducción de guías para la enseñanza de la biología y el estudio del medio ambiente a los diferentes niveles de enseñanza;
 - i) establecer la lista de libros especializados y del material necesarios para la enseñanza de las ciencias integradas y de las ciencias biológicas;
 - j) preparar los informes requeridos por la UNESCO o el PNUD;
 - k) ejecutar las tareas que pudiera encomendarle el Director nacional o el jefe del proyecto en lo que se refiere a su especialidad.
5. Requisitos:
 - a) Diploma universitario en ciencias biológicas o en campos vecinos;
 - b) profesor en el campo del estudio del medio ambiente y de las ciencias biológicas;
 - c) experiencia de la formación del personal docente;
 - d) experiencia personal de las condiciones de vida y de trabajo adquirida en países africanos en vías de desarrollo;
 - e) aptitud para el trabajo en equipo.
6. Idiomas: Español; el conocimiento del inglés o del francés constituiría una ventaja.
7. Duración: Un año, empezando lo más pronto posible.

DC/EQG/71/501/ED/008 Rev. 2
27 de julio de 1976

8. Sueldos y subsidios internacionales (P.4):
(Exentos del impuesto nacional sobre la renta y pagaderos parcialmente en las divisas del país de origen o del país de destino del funcionario).

- Sueldo básico anual: el equivalente de.....Neto \$17,532
- Ajusto por lugar de destino oficial (costo de vida, sujeto a modificación sin aviso previo) en esta fecha el equivalente en moneda local de.....\$6,769 (\$4,646 si el interesado no tiene personas a cargo)
- Subsidio por misión (subsidio por expatriación): el equivalente en moneda local de.....\$2,000 (\$1,600 si el interesado no tiene personas a cargo)
- Subsidios familiares: cónyuge a cargo.....\$400 por cada hijo a cargo.....\$450

La Unesco abonará los gastos de viaje del experto y de las personas a su cargo (cónyuge e hijos menores de 18 años). Además, la Unesco contribuirá a los gastos de instalación en el lugar del destino oficial y de educación de los hijos a cargo. Al cesar en el servicio se abonará al interesado una prima de repatriación.

A N E X O

3. Antecedentes:

Guinea Ecuatorial, que ha accedido a la independencia en octubre de 1968, tiene una superficie de 28.051 kilómetros cuadrados y una población total estimada, en 1970, en alrededor de 350.000 habitantes. El territorio nacional está formado por la provincia continental de Río Muni con las islas Corisco y Elobeyes y por la provincia insular de Fernando Póo con las islas de Fernando Póo y Anobon. Las ciudades más importantes son Santa Isabel en la isla de Fernando Póo y Bata en Río Muni.

Su sistema educativo, establecido durante el período previo a la independencia, comprende escuelas primarias, escuelas de enseñanza media general, un curso pre-universitario anejado a las escuelas secundarias, una escuela de aprendizaje industrial y dos escuelas de magisterio.

En 1970-71, el número de alumnos de todas estas escuelas ascendía a 45.000.

El Ministerio de Educación Nacional ha debido enfrentarse, desde el primer momento, a los siguientes problemas, todos ellos muy graves:

- programas con carácter enciclopédico y sobrecargados, de ningún modo adaptados al medio ambiente guineano, urbano o rural;
- métodos de enseñanza defectuosos y ya abolidos en el país de origen;
- personal docente nacional insuficiente e insuficientemente calificado: sobre 99 profesores nacionales en la enseñanza media, técnica y normal, únicamente 12 están calificados: 4 licenciados y 8 sacerdotes; sobre 600 maestros de primaria 363 no tienen preparación alguna;
- carencia de locales adecuados y de material pedagógico.

Después de la llamada lanzada en mayo de 1969 por el Gobierno de la República la Unesco, con la ayuda financiera del FNUD, envió un contingente de 27 profesores y un experto para la puesta en marcha de una unidad de planificación en el Ministerio de Educación Nacional.

La ayuda internacional no podía ni debía prolongarse de una manera indefinida, y el Gobierno estudió las posibilidades de formar un profesorado calificado y de proceder a una reforma general de su sistema de educación gracias a la creación de un Centro de Desarrollo de la Educación. Para establecer esta institución con sólidas bases, pidió a la Unesco enviar a Guinea Ecuatorial una misión encargada de analizar la situación actual de la enseñanza y de hacer el inventario de las necesidades inmediatas y a largo plazo del país.

La misión que ha efectuado su estancia en Guinea Ecuatorial del 27 de junio al 15 de julio de 1971, llegó a la conclusión de que la creación del Centro de Desarrollo de la Educación, tal como previsto por el Gobierno correspondía a una necesidad urgente. Esta institución tendrá como objetivo:

- formar un nuevo tipo de maestros y profesores para la enseñanza primaria, secundaria general y técnicos; de inspectores de enseñanza primaria y de administradores; perfeccionar a los maestros suficientemente calificados y hacer asistir a cursillos de perfeccionamiento a los que tienen una cierta formación, inspectores de primaria incluidos;
- formar técnicos de diversas ramas;
- producir material didáctico, publicar un boletín pedagógico y manuales escolares.

El Gobierno de la República de Guinea Ecuatorial ha presentado, el 15 de octubre de 1971, una solicitud formal al FNUD con el fin de la puesta a punto de este proyecto; el documento relativo a esta reforma es del mes de junio de 1974

(Incluido en el informe presentado al FNUD el 5 de octubre de 1974)

La asistencia del FNUD está prevista para un período de 10 años, dividido en



The University of Birmingham

DEPARTMENT OF PLANT BIOLOGY

The University of Birmingham, P.O. Box 363, Birmingham B15 2TT

Telephone 021-472 1301

Mason Professor of Botany: J G Hawkes Sc D

17th September 1976

JGH/EMH

Professor David Rogers,
1229 University Avenue,
University of Colorado,
Boulder,
Colorado 80309,
U.S.A.

Dear Dave

A few weeks ago two IBM people came to see me as the result of your kind letter to Dr Gary S.Kozak, Director of Science and Contribution Programs in Paris. We had a most interesting conversation and before leaving, the two people concerned, Mr Atkinson and Mr Peppercorn, thought they might be able to help in the following way. They agreed that what was needed was for them to provide a fellowship, for a period to be suggested by you, so that one of my staff could be trained by you in Boulder in all matters concerning the Exir program. He would then be able to train our M.Sc. students more than we are able to do at present in the agreed data system for global use in GR/CIDS work. The man I had originally hoped to send you has had to take a job at Kew long ago.

I would be grateful to have your reaction to this proposal, and also to know how long you think a person like Trevor Williams, for instance, might need to be with you to become thoroughly conversant with this work.

Another point I wanted to discuss with you concerns the EUCARPIA European Regional Gene Bank Network. As you probably remember, I am chairman of the Eucarpia Gene Bank Committee, of which a working group has just met in Poland. Our next meeting, in late March, 1977 will be at Krasnodar in the USSR, where newly established storage facilities have been built. One of the urgent topics now under discussion for the European network is the GR/CIDS programme and I am wondering whether you would be able and willing to take part? You did very well for us at Izmir, where it all began, so I very much hope you will be able to come to Krasnodar and spread the light in Europe! Is there any chance of this happening? Finally (and this I am afraid is a letter of requests!) could you envisage the possibility of one of your staff taking part in a meeting next September in Birmingham on data storage and retrieval for genetic resources work? It might only be possible if someone happened to be in Europe anyway, since no funds can be provided (though I could look after hotel bills if necessary). I am President of Section K (Botany) of the B.A.A.S. next year and my presidential address will be on plant genetic resources. The draft programme is enclosed. If you were likely to be here it would be first-rate, but its not a very high-powered meeting, so one of your staff would be, fine though of course not so good. I should explain that the B.A.A.S. is our equivalent of your "triple-A.S" in the U.S.A.

Well, that's all the requests, and I am sorry for so many. I am sure you will understand, though, how important the first two are for Europe. The third would be nice but is less wide-ranging.

All the best to you and Connie.

Yours ever,

A handwritten signature in cursive script that reads "Jack". The signature is written in dark ink and has a long, sweeping horizontal stroke extending to the right.

Professor J.G. Hawkes

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

MEETING AT UNIVERSITY OF ASTON, BIRMINGHAM 1977

FIRST DRAFT

THE CONSERVATION OF PLANT GENETIC RESOURCES - SEPTEMBER 5th

9.30 - 10.30 Presidential address: Professor J.G. Hawkes

10.30 - 11.00 Coffee

Chairman: Professor J.G. Hawkes

11.00 - 11.30 The genetic variability of crop plants Dr Alice Evans (Cambridge)

11.30 - 12.00 Plant exploration. Capturing genetic variability - Dr J.T. Williams
(Birmingham)

12.00 - 12.30 Conservation I. The long-term storage of viable seeds.

Professor Eric Roberts (or one of his group) (Reading)

12.30 - 1.00 Discussion

1.00 - 2.00 Lunch

Chairman: Sir Joseph Hutchinson

Conservation II. The long-term storage^{of} plant tissues by means of
meristem and other in vitro techniques

Dr G.G. Henshaw (Birmingham)

2.45 - 3.15 Information. Data storage and retrieval systems in genetic resources
information exchange

(Suggestions from Dr David Rogers, University of Boulder, USA)

3.15 - 3.45 Tea

3.45 - 4.15 The end results. Breeding new crop varieties, Professor Ralph Riley,
(P.B.I. Cambridge)

4.15 - 4.45 Discussion.

17 Sept 76

Dr. David J. Rogers
Director, Taxometrics Laboratory
University of Colorado
Boulder Colorado 80309

SEP 11 1976

Dear Dave,

After our several unsuccessful attempts to get in touch by phone, I write to learn when Claudio Spiegel will come to Ann Arbor. Claudio mentioned the second week in November as a possible time to arrive. This would be a good time for many reasons, not the least among them the availability of our computing center staff. There will be a large MTS workshop, involving the systems programmers from the other University computing centers that use MTS, until October 20, and so before that time our computer center staff will be quite busy. The disadvantage of his coming much later than that second week in November is that I will be very involved with end of term teaching duties. I run the introductory course in Biology for prospective majors and premeds this term and, quite frankly, that is a lot of work. I also give Quantitative Systematics to a couple of dozen graduate students, that is more fun but still very time consuming. I need to begin to arrange living

accommodations for our three visitors. Short term in hotels is not only unfriendly but quite expensive. There is a possibility that arrangements can be made in a boarding house close to campus in the "faculty neighborhood" that would be comfortable, friendly, convenient and not so expensive as hotel. But, I need a little advance time to make reservations as such houses cater to visiting lecturers etc and tend to book well in advance. I would be pleased to talk about details on the phone if you would like to call. Good times are indicated on my enclosed schedule.

I hope all is well with you and Connie, and that the Taxometrics Lab is thriving. My friend Cindy Carey is to join your staff in the Biology Department there. I think CU is picking up a good animal physiologist there.

Please write me a note or call soon so I can go forward with plans to accommodate our visitors.

Sincerely,

George

Year: 76
 Check
 Term X

NAME ESTHER BROOK

Fall

Winter

Spring

Summer

Spr-Sum

LOCATOR

Office(s) 4091 NAT SCI 2000 NUB

Office Phone(s) 764 6219 764 4207

Ann Arbor Address and Phone (optional): _____

Faculty: Please indicate in the spaces below your office hours, counseling hours, location of courses taught, etc. Graduate Students: Please include courses elected.

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
8-9						
9-10		Counseling BIOLOGY				
10-11				DIVISION CURRIC-		
11-12		105 PRELAB 1053 NS	474 Lecture 2111 NS	1100 ²⁰³³ Comm. NS	474 Lecture 2111 NS	
12-1	105 Lect	105 2111 NS Office			2111 NS ECOLOGY LUNCH	
1-2	11H HVD B					
2-3	EXAM			105		
3-4	GRA- DING			LAB	105 PREP	
4-5				2004 NS	Session 2004 NS	
5-6					105 ROGRADE	
Eve	✓	BIOL. 474 LAB ↓ 2111 NS		105 Section 57 Discussion 1053 NS		

10



indicates reasonably
 good time to call

SEP 22 1976

Sep. 16, 1976

Prof. David J. Rogers
University of Colorado
Boulder, Colo. 80302

Dear Mr. Rogers:

To introduce myself, I am the editor-designate of a new magazine called Garden that the New York Botanical Garden is currently testing. If the test (mail-order) succeeds, the magazine will begin appearing next March. Accordingly, I am lining up editorial possibilities for the first issues. Howard Irwin has told me about the work you have done on the cassava and your current project on the grape, and I am extremely interested in the latter.

Do you think you could let me know what the status is of your study? Do you have anything written on it yet-- for example, a preliminary proposal or outline?

My background is journalistic and my grounding in botany is virtually zero (Howard is willing to accept that) but I find myself fascinated by the general subject of the origin of plants-- something I was not particularly aware of as an ordinary reader. I'm sure we could produce a fine article on your study, and I'd love to hear how you are progressing on it. Or would it be better for us to try something on your cassava study? For the average American reader, of course, the grape has more interest.

I look forward to hearing from you.

Sincerely yours,

Oliver E. Allen
Oliver E. Allen

P.S. Better write to me at the above address, as my offices at the Garden are somewhat in a state of flux.

Ans. 9/28/76

Schedule of NSF Programs for Education in the Sciences—Fiscal Year 1977 (Revised August 1976)

This consolidated table presents important time-schedule information concerning NSF programs for education in the sciences. It is intended as a convenient reference for: (1) individuals applying for fellowships or professional development grants and (2) institutions submitting proposals for the conduct of other listed programs and projects. Although application closing dates are firm, award dates are approximate:

INFORMATION FOR INDIVIDUAL APPLICANTS

	Program Announcement Availability	Application Closing Dates	Award Announcement Dates	Pertinent Publications
FELLOWSHIPS				
Graduate Academic Year 1977-78	Sept. 1976	Nov. 29, 1976	March 15, 1977	SE 77-10
National Needs Postdoctoral Fellowships	Sept. 1976	Dec. 3, 1976	March 16, 1977	SE 77-13
North Atlantic Treaty Organization (NATO) Postdoctoral Fellowships	Sept. 1976	Nov. 22, 1976	April 15, 1977	SE 77-17
PROFESSIONAL DEVELOPMENT GRANTS				
National Needs Science Faculty Professional Development Program	Oct. 1976	Jan. 7, 1977	April 29, 1977	SE 77-28

Note: Because the dates above are subject to change, prospective applicants should consult specific program announcements for exact final dates.

* Program administered by NSF for U.S. citizens at the request of the Department of State.

INFORMATION FOR INSTITUTIONS SUBMITTING PROPOSALS

(NOT for Individuals Applying for Participation)

	Program Announcement Availability	Proposal Closing Dates (receipt in NSF)	Grant Award Dates	Pertinent Publications
DIVISION OF SCIENCE MANPOWER IMPROVEMENT				
National Needs Graduate Traineeships	Oct. 1976	Jan. 3, 1977	April 4, 1977	SE 77-12
Minority Institutions Graduate Traineeships	Oct. 1976	Dec. 15, 1976	March 1, 1977	SE 77-15
Faculty-Oriented Programs				
Science Teacher Training Program	Nov. 1976	Dates to be announced		SE 77-27
Student-Oriented Programs				
Student Science Training	June 1, 1976	Oct. 8, 1976	Jan. 28, 1977	SE 77-20
Undergraduate Research Participation	June 1, 1976	Sept. 10, 1976	Feb. 15, 1977	SE 77-21
Student-Originated Studies	Sept. 1976	Dec. 1, 1976	March 15, 1977	SE 77-22
Women in Science	Sept. 1976	Nov. 19, 1976	April 15, 1977	SE 77-26
DIVISION OF SCIENCE EDUCATION RESOURCES IMPROVEMENT				
Comprehensive Assistance to Undergraduate Science				
Education	Sept. 1976	Dec. 3, 1976	May 25, 1977	SE 77-30
Minority Institutions Science Improvement	Aug. 1976	Dec. 3, 1976 April 1, 1977	April 1, 1977 August 5, 1977	SE 77-31
Undergraduate Instructional Scientific Equipment	Sept. 1976	Feb. 4, 1976	July 29, 1977	SE 77-32
Local Course Improvement (Replaces Restructuring Undergraduate Learning Environment)	Sept. 1976	Nov. 5, 1976	March 15, 1977	SE 77-34
Research Initiation and Support	Sept. 1976	Dec. 10, 1976	April 15, 1977	SE 77-38
Pre-Service Teacher Education	Oct. 1976	Open	Open	SE 77-35
DIVISION OF SCIENCE EDUCATION DEVELOPMENT & RESEARCH				
Pre-College Materials Development, Testing and Evaluation	Anticipated funding restrictions may be such as to permit no new starts			
Science Education Development	Sept. 1976	Open	Open	SE 77-50
Technological Innovation in Education Alternatives in Higher Education Continuing Education for Scientists and Engineers				
Science Education Research	Dates to be announced in NSF Bulletin			SE 77-55
OFFICE OF SCIENCE AND SOCIETY				
Public Understanding of Science	Jan. 1977	Open	Open	SE 77-60
Ethical & Human Value Implications of Science and Technology	Jan. 1977	Open	Open	SE 77-62

SEP 23 1976



INTERNATIONAL COUNCIL OF SCIENTIFIC UNIONS
COMMITTEE ON DATA FOR SCIENCE AND TECHNOLOGY

CODATA SECRETARIAT : 51, BOULEVARD DE MONTMORENCY - 75016 PARIS - FRANCE - TEL. : 525.04.96 - CABLES : ICSU PARIS 016
TELEX : 630553 F

Executive Secretary:

Bertrand Dreyfus

September 16, 1976

Dear Contributor to the CODATA Proceedings:

Please find enclosed an edited copy of the paper you presented at Boulder, in the typewritten form given to it by Pergamon Press for publication in the forthcoming Proceedings volume.

I would appreciate receiving as soon as possible, and in any case no later than October 1, 1976, any comments or corrections you might have after careful proof-reading of your text. I trust you will understand that because of the rigid deadlines imposed by Pergamon Press, no extensive modification of your paper can be accommodated, so please restrict yourself to typing errors and vital mistakes or omissions.

You will notice that the title of your paper, as well as your name and professional address, is missing altogether. This is because we are going to compose them in another typeface, requiring the use of another machine.

Looking forward to hearing from you very soon, I remain

Yours sincerely,

Bertrand Dreyfus

Bertrand Dreyfus
Executive Secretary, CODATA

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Genetic Resources

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Rogers, Helen J. April

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The Genetic Resources Communication, Information, and Documentation System (GRCIDS) is being developed for the genetic resources of plants, specifically for those genetic resources that are propagating materials, either seeds or vegetative portions of the major economic plants of the world, especially the cereal grains, the roots, the tuber crops and vegetables. While this implies that our first interest or concern is with food plants, we expect that our system will be applied to economic non-food plants of importance to mankind. The development of GRCIDS is sponsored by the International Board of Plant Genetic Resources (IBPGR) which is supported by the Consultative Group on International Agricultural Research (CGIAR)(1). GRCIDS is intended to serve international agricultural agencies and national agencies which need documentation and communication of data about crop plants.

The objective of the IBPGR is to conserve the wild relatives, the primitive cultivars, and the important breeding lines of certain priority crop plants (2).

It was recognized at an early stage by the IBPGR that the knowledge about material already collected and now maintained was as important as knowledge about materials which will be collected in the future.

Clearly, one must have an integrated information management system in order to know what has been collected, and what is being maintained. A program by which the data can be brought into some system and communicated to others is also important.

At the outset in our development of the GRCIDS system, we recognized that many powerful systems for information and data management have been developed, one of these, GENSTAT, at the Rothamsted Experimental Station in England, and another, SAS, at North Carolina State University. It is not our intent to supplant these systems, but rather to integrate them into an overall process or program whereby data from each activity associated with genetic resources can be adequately handled and manipulated. In the event that some data management technique is not a part of the preexisting system, we hope to supplement. For example, a data storage and retrieval system which can quickly extract precise subsets of data from a data bank is a necessary supplement of the GENSTAT and SAS systems.

An examination of the various functions carried out by workers in genetic resources is essential

to assure proper design. Figure 1 identifies the major functions or activities carried out in genetic resources, and indicates the relationships of the communication, information and documentation systems to these functions. The first activity is the collection of genetic resource material from farmers' fields, from markets, and/or from the wild. One must obviously do explorations in order to make these collections. Each of these activities generates data, and these must be documented. Evaluation enters into collection and exploration through understanding what has already been collected, and determines what still remains to be collected in a particular area. The conservation of genetic resources functions is complex, involving many disciplines and generating many data. Overlapping the function of conservation is the function referred to in Figure 1 as improvement, from simple selection through complex breeding programs. Again, both conservation and improvement generate large data banks, and these, too, require careful use and proper storage and retrieval. Improvement clearly is a step in which evaluation plays an important role. Following improvement, production is a necessary part of the overall function of genetic resources.

Figure 1
Relation of Communication, Information and
Documentation Systems to Major Genetic Re-
sources Functions

Figure 2 further identifies the functions that must be integrated in a genetic resources system. The triangle shows the central role of documentation systems in the management of genetic resources, both in conservation and improvement. In both cases, data bases are formed. The purpose of

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Figure 2
Role of Documentation and Analysis in Genetic Resources Conservation and Improvement

maintenance, obviously, is to keep in good condition all those genetic resources that have been collected. Each activity has a need for some data management system. Similarly, improvement has several types of functions that demand a data system of some sort, whether it be a statistical analysis or some multi-variate analysis technique in order to understand the data that have been collected in association with improvement.

As in many other important complex and interrelated activities today, a concept of an overall information or data management system has been developed for genetic resources. We have developed that system under the acronym EXIS (EXecutive Information System; EXecutive meaning to execute or carry out, not to direct). All of the computer-based functions are subsumed under this title, and Figure 3 gives the overall pattern of development and content of the EXIS system, where data storage and retrieval, using a program called EXIR (EXecutive

Information Retrieval) is a beginning point. Other data storage and retrieval systems, as an example, form a part of EXIS. A very important function of the system is file manipulation. And the output from any system, report generation, is a necessary thing. Statistical analysis simply implies that there are other activities associated with the data where the data can be employed in many different ways to derive meaning as an important function in the communication, information and documentation system.

Because of the multitude of different kinds of data-processing devices available around the world, it is extremely important that the EXIS system be written in the most nearly universal language available to us at this time. We have adopted FORTRAN and ANSI STANDARD FORTRAN IV, not because it is necessarily the most efficient in any one particular computer, but simply because there is no other system that comes as close to having a universal capability on many different computers as does this particular one. The EXIS system contains several components that have already been prepared, one of which is EXIR, a data storage and retrieval program written in ANSI STANDARD FORTRAN IV, now running on computer machines manufactured both in the United States and in other countries as well.

The next two figures illustrate development of the EXIS system and the concepts therein. Figure 4 starts with an information storage and retrieval program (ISR). Any of several programs could be used. In our concept, data flow moves from the information storage and retrieval system either into the synthesis or analysis modules or into display programs. In either case, data or the results of data manipulation are finally displayed in one of a series of techniques, indicated by REPORT GENERATOR, a default print system, or by various types of graphic display.

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chapter or paper
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OF EACH CHAPTER
OR PAPER SHOULD
BE AS INDICATED
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Type Authors Name

Type Authors Address

COMMENCE text of article here

be input to one of the other packages where this is desirable and where those particular systems packages are available. We have a series of single-purpose, self-contained programs that are useful and these are indicated in class two of the synthesis analysis programs in Figure 5.

The above illustrations do not give full details, nor do they indicate that all of the necessary computer-aided programs are now fully functional in the GRICIDS system. The GRICIDS system is greater than just its integrated computer software. GRICIDS is the method by which these programs are employed and the results gained in the development of better food systems, which is the overall objective of the International Board of Plant Genetic Resources, and therefore our objective.

Data management techniques are of critical importance, because of the high costs of data themselves and because we are indeed a truly international and integrated activity where workers in one part of the world are in great need of accurate and instant communication between themselves and workers somewhere on the other side of the world.

References

1. See Science, Vol. 188, No. 4188, 9 May 1975.
2. Hersh, G.N. and Rogers, D.J., Documentation and Information Requirements for Genetic Resources Application, in Crop Genetic Resources for Today and Tomorrow, Cambridge University Press, 1975.

Figure 4
Data Flow Through EXIS Components

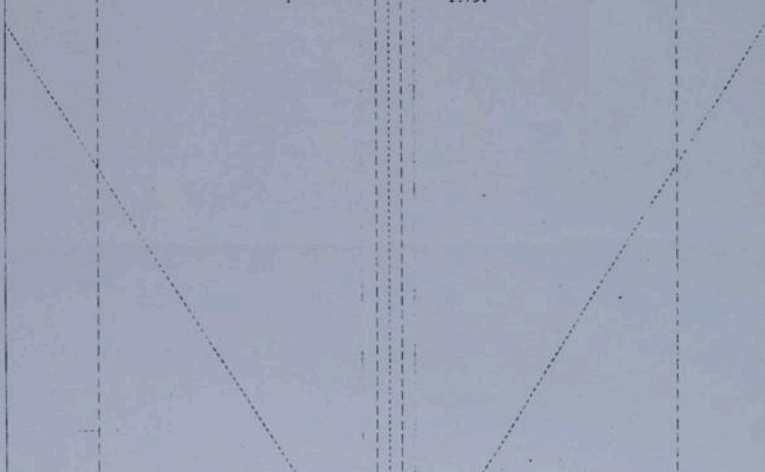


Figure 5
Types of Synthesis Analysis Programs

packages. As we have classified the different programs, they are systems packages or single-purpose, self-contained programs or subroutines and libraries. We intend by this that there should be connections between the EXIS system such that output from an information storage and retrieval system could



LEMBAGA ILMU PENGETAHUAN INDONESIA (L.I.P.I.)
LEMBAGA BIOLOGI NASIONAL

(NATIONAL BIOLOGICAL INSTITUTE)

Jalan Ir. H. Jusada 11 - Bogor

ALAMAT KAWAT (CABLE ADDRESS) : "DIRBIONAS"

SEP 20 1976

P.O. BOX 110, BOGOR

PHONE : Bos. 245 407. 157

No. : 2078/IA/1b/76.-

BOGOR, September, 14 19 76

Surat Tn. (Your ref) :

Lampiran (encl) :

Hal (Subj. matter) :

✓ Dr. D.J. Rogers
Director
Taximetrics Laboratory
229 University Avenue
University of Colorado
Boulder, Colorado 80309

*replied,
Sept.*

Dear Dr. Roger,

Thank you very much for your letter of September 2, 1976.

I would like to extend my apologize for not responding to Mr. Hersh's letter. The thing is, the term of reference of the training you offer is not found in the term of reference that our government has, specifically in term of financial support. The Indonesian government would like to know exactly what the offer will cover, which I am not sure either. Secondly, right at the moment the documentation in our institute is still handled manually. I hesitate to change the system to a computerizing it due to the cost which will be involved as a consequence of it.

Concerning your visit to S.E. Asia, may I suggest that you will be in IRRI the first week of December? The reason is this. The S.E. Asian working group on Plant Genetic Resources will meet in Los Banos December 6 to 10. This meeting is the follow up of Bogor Meeting in March 1975. Among the problems discussed in the meeting will be documentation and training. Therefore, it will be useful for all the delegates from S.E. Asia to meet personally with you. It is also beneficial from your point of view if the cooperative efforts are developed not only between our institute and your laboratory but between S.E. Asian countries and your laboratory. Please write to Mr. R.J. Pichel for the exact information concerning the Los Banos meeting.

Dr. Sastrapradja
March 12, 1976
Page Two

March 12, 1976

series of questions that we would like you specifically to answer. I will send you a copy of the work that we have done for the

Dr. Setijati Sastrapradja collection, as well as a recent report from the
Director
Lembaga Ilmu Pengetahuan Indonesia (L.I.P.I.)
Lembaga Biologi Nasional
(National Biological Institute)
Jalan Ir. H. Juanda 11
P. O. Box 110
Bogor, Tulin

Dear Dr. Sastrapradja:

I was very pleased to see you in Rome during the IBPGR meeting. We would also like to thank you for the copy of the Proceedings of the Symposium on Southeast Asian Plant Genetic Resources which you mailed on February 3, and which arrived here on March 5. I have not yet had a chance to read the articles, but hope to do so this week.

As I mentioned to you at the Board meeting, we would like to have a recommendation from you of either a student at the senior level, or a staff member of yours who might intern with us for a period of at least one year. We would like to use this individual in the general work of data base formation and transfer, as it is described in our report and contract proposal, which may not necessarily be in Southeast Asia. We feel that, at the end of this year, either another year of internship might be useful (if it is jointly agreed to), or that this individual may return to your center, able to assist with the entire problem of documentation at your center, or possibly even to train individuals throughout the Southeast Asian area.

It is our understanding that we would meet the following costs: transportation to the United States, and an adequate living allowance. As we discussed, a specific salary as such would not be required.

If you have any such people in mind, please send us their resumes and your recommendations. We will be more than pleased to follow your advice. We would hope that this be considered a joint project between your center and us.

I do remember that I promised to send you some material for your review, specifically the paper we are preparing on the Maize Genetic Resources, which includes the "CIMMYT Report/Catalog". We will send these off to you within the next two to three weeks, and enclosed will be a

LEMBAGA BIOLOGI NASIONAL

Dr. Setijati Sastrapradja
March 12, 1976
Page Two

NATIONAL BIOLOGICAL INSTITUTE
Jalan P. H. Simanungkalit, Bogor
ALAMAT KAWAT (CABLE ADDRESS) "BIOLOGI NASIONAL"

TELEPHONE: 0261-712201-1

BOGOR, February 2, 1976

series of questions that we would like you specifically to address. We will also send to you a copy of the work that we have done for IITA, Ibadan, on their Vigna species in collection, as well as a recent report that we have presented to the Centro Internacional de Papas (CIP)/Peru.

When we were discussing certain points about follow-up from the Bogor meetings, you mentioned a technical seminar which you are preparing for the Southeast Asian area, and that it might be possible for us to participate in a one-day session. Is this still an option? If so, how may we assist you in preparing an agenda for that one day's presentation? If a presentation is useful, we would like to do it jointly with your center. Also, we would like to use examples and make demonstrations indicative of operations at your center. Could we possibly get a pilot project sample of the data at your center on collections in storage and personnel involved in crop sciences in Southeast Asia?

We look forward to working closely with you in the near future and hope that we can provide assistance to you. We are also looking forward to your comments and criticisms of our work to date, and to working jointly on a number of important and productive matters.

Dear Dr. Rogers,

Again, thank you for your time at the Board meeting. It was my pleasure to see you once again. I look forward to seeing you some time in Boulder.

Once again thank you very much for your personal interest and

Cordially,

Interest.

With best regards.

Gilbert N. Hersh
Associate Director

GNI:hf

Sincerely yours,

Dr. Setijati Sastrapradja

Director



LEMBAGA ILMU PENGETAHUAN INDONESIA (L.I.P.I.)
LEMBAGA BIOLOGI NASIONAL

(NATIONAL BIOLOGICAL INSTITUTE)
Jalan Ir. H. Juanda 11 - Bogor
ALAMAT KAWAT (CABLE ADDRESS) : "DIRBIONAS"

PHONE : Bso. 245. BOT. 177

P.O. BOX 110. BOGOR

No.

: 256 / I. D₂ / 76

BOGOR, February, 3rd 1976

Surat Tn. (Your ref) :

Lampiran (encl) : 1 (one)

Hal (Subj. matter) :

Dr. David J. Rogers
Taximetrios Laboratory
University of Colorado
Boulder, Colorado
U.S.A.

Dear Dr. Rogers,

Herewith I send you a copy of the Proceeding of the Symposium
on S.E. Asian Plant Genetic Resources.

Once again thank you very much for your participation and
interest.

With best regards.

Sincerely yours,

Dr. Setijati Sastrapradja

Director

make card



SEP 7 1976

INTERNATIONAL COUNCIL OF SCIENTIFIC UNIONS
COMMITTEE ON DATA FOR SCIENCE AND TECHNOLOGY

CODATA SECRETARIAT : 51, BOULEVARD DE MONTMORENCY - 75016 PARIS - FRANCE - TÉL : 525.04.96 - CABLES : ICSU PARIS 016
TELEX : 630553 F

Executive Secretary:
Bertrand Dreyfus

August 27, 1976

Dr. David J. Rogers
Taximetrics Laboratory
University of Colorado
Boulder, Colorado 80309
U.S.A.

Dear Dr. Rogers:

Thank you for sending me the manuscript of your CODATA Conference paper on "An Information Management System for Genetic Resources".

I completed the editing of it last week and forwarded it to Pergamon Press, who is in charge of the publication of the forthcoming Proceedings volume.

In the mean time, if you could send me the original prints of your 5 drawings, the printer would appreciate it since it would enable him to work from the best possible documents rather than from more-or-less satisfactory reproductions.

Hoping that you can let me have these documents at your earliest convenience, I thank you in advance for your cooperation, and remain,

Yours sincerely,

Bertrand Dreyfus

Bertrand Dreyfus
Executive Secretary, CODATA

BD:as

Aug 25, 1976

NATIONAL SCIENCE FOUNDATION

PROPOSAL RATING SHEET

Reviewer: David J. Rogers, Professor
EPO Biology
Hale Science Bldg.
University of Colorado
Boulder, Colorado 80309

Proposal No.: DEB-76-84109
Investigator: WHITTIER, Henry O.
Institution: Florida Tech. Univ.
Please return to Systematics
If possible by: 12 OCT 1976

Comments (Continue on additional sheet if necessary)

This is, in general, a very well presented request for a systematic study of a moss family, with which this reviewer is not particularly familiar. It does, however, set the right stage for what this reviewer considers to be significant--botanical studies of plants of importance in man's environment. Clearly, the basis for such work is monographic analyses, which provide the foundation on which any improvement must be founded. The PI is well qualified for this work.

It is not clear to me why the author labelled this application as a "computer-assisted study". Though the PI did state that he hopes to use some kind of computer analyses, he does not state whether the various programs briefly mentioned are already available to him in Orlando at his computing center or not. His budget request does not include either computer time or functions for programming assistance. Perhaps the PI should be encouraged to be more specific as to just what procedures in either taximetrics or numerical taxonomy will be employed.

OVERALL RATING

- ☐ EXCELLENT
☐ VERY GOOD
☐ GOOD
☐ FAIR
☐ POOR

Signature of Reviewer:

Other suggested reviewers (optional)

Verbatim but anonymous copies of reviews will be sent only to the principal investigator/project director on request, subject to this NSF policy and applicable laws, including the Freedom of Information Act, 5 USC 552; reviewers' comments will be given maximum protection from disclosure.

NATIONAL SCIENCE FOUNDATION

WASHINGTON, D.C. 20540

9-29-76

Dr. David J. Rogers
Taximetrics Lab
Department of Biology
University of Colorado
Boulder, Colorado 80302

Dear Dr. Rogers:

Ref: WHITTIER

We would greatly appreciate your help in evaluating the enclosed proposal. In order to obtain a fair and critical review for every proposal, the Foundation relies heavily on the advice and guidance of experts in each field. Please comment on the scientific merit of the project, including the significance of the objectives and the adequacy of the experimental procedures. Consider the capacity of the investigator to conduct the project as evidenced by his or her knowledge and related published work, training, and previous research contributions. Note the adequacy of the facilities described.

The Foundation receives proposals in confidence and is responsible for protecting the confidentiality of their contents. For this reason, we ask that you refrain from copying, quoting or otherwise using material for this proposal. If you believe that a colleague can make a substantive contribution to the review, please consult me before disclosing either the contents of the proposal or the applicant's name. When you have completed your review or if, for some reason, you find yourself unable to respond to this request, please destroy the proposal.

VERBATIM COPIES OF REVIEWS, RATINGS, AND ASSOCIATED CORRESPONDENCE WILL BE SENT TO THE PRINCIPAL INVESTIGATOR/PROJECT DIRECTOR ON REQUEST. The copies will not contain your name, the name of your institution or names which might constitute an invasion of the privacy of others. Subject to this Foundation policy and applicable laws, including the Freedom of Information Act, 5 USC 552, your participation as a reviewer and the content of your review will be given the maximum protection from disclosure. The Foundation will publish annually a list of the names and addresses of persons who have reviewed proposals. Individuals will not, however, be identified with specific proposals. In this way the Foundation can publicly acknowledge your service as a reviewer and at the same time protect the confidentiality of your comments.

Be sure to enter your overall rating of the scientific merit of the proposal at the bottom of the rating sheet. Budgetary aspects are not to enter into the rating, but your comments on the budget are welcome. Duplicate rating sheets are enclosed, together with a pre-addressed envelope for the return of one of these sheets to us by the date stamped in the upper right hand corner. You may retain the other sheet if you wish. We would like to thank you in advance for your help in making our proposal review process a judicious one.

Sincerely yours,

Ellen King

for Janice C. Coffey
Associate Program Director
Systematic Biology

Enclosure

SYSTEMATIC BIOLOGY PROGRAM

GUIDELINES TO NUMERICAL RATING SYSTEM FOR PROPOSALS

- | | | |
|---|-------------|---|
| 1 | EXCELLENT | Highly meritorious and deserving of top priority for funding. This rating should be reserved for truly excellent proposals, but should be used without hesitation when warranted. |
| 2 | - VERY GOOD | Proposals considered superior, both for the intrinsic merit of the project and the ability or potential of the investigator, but with secondary priority. |
| 3 | = GOOD | Quality sufficiently high to warrant consideration for support, but definitely with tertiary priority. When funds are scarce, such a proposal will seldom be funded. |
| 4 | = FAIR | Unsupportable in present form; might merit consideration for support if resubmitted with major changes. |
| 5 | POOR | Unsupportable. |

Important Note: Ratings range from 1.0 through 5.0, but you are encouraged to use fractional ratings in your evaluation; e.g., 1.2 indicates a rating just below the very top, 1.5 indicates an evaluation halfway between first and second priority, etc. When using fractions, please indicate by writing in the number as well as by location of your "X" in the rating column.

NATIONAL SCIENCE FOUNDATION

PROPOSAL RATING SHEET

Reviewer

Proposal No.: DEB 76-83109
Investigator: WHITTIER, Henry O.
Institution: Florida Tech. Univ.
Please return to Systematics
If possible by: 12 OCT 1976

Comments (Continue on additional sheet if necessary)

OVERALL RATING

- ☐ EXCELLENT
☐ VERY GOOD
☐ GOOD
☐ FAIR
☐ POOR

NSF Form 173, Jan 1976

Signature of Reviewer:

Other suggested reviewers (optional):

Verbatim but anonymous copies of reviews will be sent only to the principal investigator/project director on request. Subject to this NSF policy and applicable laws, including the Freedom of Information Act, 5 USC 552, reviewers' comments will be given maximum protection from disclosure.

Aug 25, 1976
76-83109

RESEARCH PROPOSAL SUBMITTED TO THE NATIONAL SCIENCE FOUNDATION

Proposed Amount \$25,754.00 Proposed Effective Date March, 1977
Proposed Duration 24 months
Title Systematics of Leucobryaceae - A Computer Assisted Study
Principal Investigator Henry O. Whittier Soc. Sec. No. 297-32-9086
Submitting Institution Florida Technological University
Department of Biological Sciences Address Orlando, Florida 32816
Make grant to Florida Technological University

Endorsements:

Principal Investigator(s)	Dept. Head	Institutional Admin. Official
Name <u>Henry O. Whittier</u>	<u>David Vickers</u>	<u>Leslie L. Ellis</u>
Signature <u>[Signature]</u>	<u>[Signature]</u> <i>18 Date for D. H. Vickers</i>	<u>[Signature]</u>
Associate Professor	Dept. Chairman	Associate Vice President and
Title <u>Biological Sciences</u>	<u>Biological Sciences</u>	Dean, Graduate Studies and Research
Telephone Number <u>(305)-275-2141</u>	<u>(305)-275-2141</u>	<u>(305)-275-2671</u>
Date <u>8/25/76</u>	<u>8-26-76</u>	<u>8/26/76</u>

RESEARCH PROPOSAL SUBMITTED TO THE NATIONAL SCIENCE FOUNDATION

Title: Systematics of Leucobryaceae - A Computer Assisted Study

Principal Investigator: Henry O. Whittier

Institution: Florida Technological University
Orlando, Florida 32816

A B S T R A C T

The direct economic importance of mosses has been limited almost exclusively to temperate climate, peat-forming kinds as Sphagnum. Recent research has shown that for tropical agriculture a real potential exists in an unrelated moss family, the Leucobryaceae. Because of their unique physical construction, they possess the ability to hold and retain large amounts of moisture, much as does Sphagnum. Importantly, their natural distribution lies primarily in the tropics and subtropics where Sphagnum is not abundant. It has been demonstrated that certain taxa can be cultivated as epiphytes, harvested, and used as a seed germination medium, in marcottage, and in other ways paralleling the uses of peat moss. This information clearly suggests the potential importance to tropical agriculture.

For meaningful comparative evaluation of the potentials of related species within the Leucobryaceae, it will be necessary to have a sound systematic base.

The purpose of the proposed research is to reevaluate, assisted by computer analysis, the systematic organization of the family Leucobryaceae, to reassess the characteristics and criteria used in classification, and, to develop, also with computer assisted analysis, a more modern phylogeny. The resultant product of this research is expected to serve contemporary specialists in moss systematics and evolution as well as to provide some basic data for continued agricultural research in various tropical regions

SYSTEMATICS OF LEUCOBRYACEAE - A COMPUTER

ASSISTED STUDY

The Leucobryaceae or "white mosses" comprise perhaps the most distinctive bryophytic component of forest or fen world around, and are particularly conspicuous in tropical forests. Because they often form extensive polsters on soil and upon the bases or in open crotches of trees, they comprise a most significant natural seeding medium for many forest species. Thus, they contribute in measure far beyond the vegetative mass represented to the maintenance of the dynamic equilibrium of tropical forest ecosystems.

Recognition of the importance of Leucobryaceae as a natural seeding medium has been noted by Arzeni (1963) in Africa, for instance, where Octoblepharum was employed to culture over twenty five species, and in air layering or marcottage. In many parts of the world it seems to be used much in the manner that peat moss (Sphagnum) is in the north temperate zone.

Because of the presence of large porose cells which have a considerable water holding capacity, cushions of Leucobryaceae seem to comprise a kind of wicked reservoir of water which buffers changes in humidity on the forest floor. This is strongly suggested by Beibl's (1964) finding that Leucobryum from the rainforests of Puerto Rico could withstand prolonged periods of exposure to about 50% humidity but that it was among the most sensitive and died quickly at humidities below about 10%.

Leucobryaceae are such an obvious and distinctive component of tropical forest vegetation that even casual collections usually contain one or more gatherings. Because of the habit, individual samples are usually substantial and not significantly collected by dissection of a portion of a leafy stem. This is fortunate because a wide variety of characters must be employed, in a manner parallel to that for Sphagnum, to achieve a proper identification, especially in the larger genera.

Identification of Leucobryaceae is presently a hit or miss proposition with heavy reliance placed upon such severely dated contributions as Brotherus (1924-25), Cardot (1900), and, for Malesia, Fleischer (1904). No group of mosses is so under-illustrated despite the necessity for drawings to emphasize the consistent but often subtle, differences among allied taxa. Thus, most reports of species are based upon identifications probably achieved by finding the description which fits best from those names reported from a particular area --- a philosophically hazardous procedure at best, but one which is practical for the floristic botanist dealing with large mixed collections.

Objectives:

- 1) To review, assisted by computer analysis, circumscription of genera within the family and their natural alliances, including evaluation of the proposed recognition of the Leucophanaceae as a segregate family.

2) To clarify and elucidate a series of morphological characteristics which can be reliably employed to distinguish genera.

3) To clarify with computer assistance, within each genus, those morphological characters which can be reliably employed to distinguish species.

4) To develop from computer-derived population analyses and by comparison of shared features, a putative phylogeny utilizing the coefficients of correlation and distance methods.

Expected Significance:

1) Establishment of new, or confirmation of existing, family and generic lines will bring this long-neglected group into line with modern bryological concepts.

2) Provision of a re-evaluation of standard morphological criteria such as leaf cross-sections and peristome details and new criteria as may be appropriate will help establish more consistent systematic determinations for future researchers.

3) Circumscription of clusters of characters confirmed by inter-population variation and significance tests which enhance ease of identification will have great pragmatic value to the working taxonomist.

4) Application of computer-generated taximetric approaches at several levels to the reasonably sized groups within the family will yield data of value to understanding of the phylogeny and speciation within the family and perhaps for mosses at large.

Present State of Knowledge

Reimers (1954) recognized the family Leucobryaceae in the usual way, with note that it contained 9 genera and about 200 species widespread in the tropics. The genera and number of species presently recognized for the family as noted in the Index Muscorum (Wijk, et al.) follow:

Arthrocormus (1)

Cardotia (2) a questionable genus

Cladopodanthus (4)

Exodictyon (16)

Leucobryum (123)

Leucophanes (41)

Ochrobryum (18)

Octoblepharum (16)

Schistomitrium (9)

Brotherus (1924-25) distributed the genera into subfamilies as follows: Leucobryoideae - Ochrobryum, Schistomitrium, Cladopodanthus, Leucobryum; Leucophanoideae - Leucophanes; Octoblepharoideae - Cardotia, Octoblepharum; Arthrocormoideae - Arthrocormus, Exodictyon. Fleischer (1904) placed all but the Leucobryoideae in the Leucophanaceae, considered a distinct family.

Andrews (1947), a taxonomic "lumper" of magnificent proportions but a perceptive bryologist nonetheless, suggested that the family was "an artifact of parallel evolution of the gametophyte," by certain

Dicranales and Pottiales as suggested by peristome morphology. No one seems to have picked up the gauntlet thus presented. With computer assisted data processing, such concepts can be quantitatively, as well as intuitively defined, and the Leucobryaceae provide an especially fortuitous opportunity for such an evaluation.

World wide, the distribution of species within genera can be summarized: Ochrobryum: S. America, Africa to Burma; Schistomitrium: S. E. Asia, Malesia; Cladopodanthus: Malesia; Leucobryum: circumtropical and temperate; Leucophanes: circumtropical; Cardotia: E. Africa; Octoblepharum: circumtropical; Arthrocnemum: Malesia; Exodictyon: India, Malesia, Pacific Islands.

It is curious that of three species of Leucobryum investigated by McClure and Miller (1967), none showed flavonoid or related compounds of the type common in the Dicranaceae and Pottiaceae, and it is the principal investigator's opinion, based in part upon his experience working in their laboratory during part of their research, corroborated by Miller (personal communication), that chemotaxonomy using these compounds seems to hold little promise at present.

The principal investigator has first hand experience with Arthrocnemum, Exodictyon, Leucobryum, Leucophanes and Octoblepharum in the field in his travels in North America, Puerto Rico, Venezuela, Guatemala, Hawaii, the Galapagos, Samoa, Tahiti, the Marquesas, and in Micronesia. He is at present undertaking revision of the Pacific

species of Leucobryaceae included in the Prodromus Florae Muscorum Polynesianae (Miller, Whittier and Whittier) scheduled for release in late 1976/early 1977 by J. Cramer's Bryophytorum Bibliotheca.

Plan of the work

Anatomical comparisons will be made among representatives of each genus employing freezing microtome or standard microtome techniques which can be effectively utilized for handling herbarium material. With the temporary morphological baseline established thus, individual genera will be studied with scoring for such characters as leaf areolation, shape, size, costa-blade ratios, chlorocyst configuration, stem anatomy, phyllotaxy, peristome structure, size and ornamentation of spores, seta structure, calyptra type, propagula, capsule structure, and operculum ratios. Other features which arise in the course of the investigation of specific genera will also be scored for computer analysis. Cardot's (1900) informative, but taxonomically incomplete "Recherches Anatomiques sur les Leucobryacees," provides many useful clues to characteristics which may be useful for indicating degrees of relationship when scored for computer analysis.

Data thus derived will be reduced to key punched computer cards so that Coefficients of Variability, Correlation, and Distance can be calculated utilizing standard programs and established procedures as proposed, for example, in Heywood (1967, 1968), Legendre (1975), Legendre & Rogers (1972) and in Sneath & Sokal (1973).

The proposed Non-Faculty Professional, B. A. Whittier, is experienced in computer data handling and has familiarity with capabilities of the University Computer Center gained during a master's research project in education (Whittier, B. A. 1975, Biology Texts Utilized in Florida Secondary Schools. Florida Sci. 38: 40-45.). She is also an experienced bryologist and will assist with anatomical studies and population scoring. Mechanics of punching the computer cards can be achieved most economically by employing an advanced undergraduate student assistant from those enrolled in the computer sciences program.

Arthrocormoideae have been selected for the first intensive review following the anatomical investigations of representative material from each genus. The group is Indo-Malesian-Pacific; all relevant literature is at hand, and an ample number of population samples is readily available for initial scoring and "debugging" of data collecting and processing problems. The next group considered will be Leucophanes, followed by Octoblepharum and Cardotia, leaving the Leucobryoideae with a large number of species until last, so that a maximum of taximetric experience can be brought to bear on the knotty problems known to exist within Leucobryum.

Although it is quite proper to expect computer assistance to aid in resolving some considerable problems on species limits, variability and relationships, the solutions must be presented to the botanical public in a usable format. It is axiomatic in bryology that good line

drawings are the superior form (photography at the scale of mosses is disappointing) of presentation for most diagnostic morphological features. It is proposed to provide drawings of high accuracy and quality to illustrate each of the generic revisions at publication time (for samples of the principal investigator's work, see Appendix A for xerox copies from his recent 1976 book "Mosses of the Society Islands.") Further, accurate drawings of leaves and other features are of utmost importance for comparative purposes, and they can be accomplished in a very short time by a practiced observer using optimum equipment. Accordingly a drawing system of appropriate quality is requested as no such equipment presently exists at Florida Technological University.

Facilities and Equipment

Space for sorting, handling, and storing specimens, including two standard herbarium cases are to be provided in 250 square feet of herbarium in support of this investigation. Laboratory space with water, electricity, a freezing microtome, herbarium dissecting microscope, staining jars, laboratory glassware, slide warmer, continuously variable temperature hot plate, movable extension arm lamp, and bench space sufficient for a microprojector, a Wild Microscope Drawing System, a regular compound and two 45 power zoom dissecting microscopes, six feet of open work bench, and a four-foot illustration area, in all about 200 square feet or 25 feet of 30 inch high bench, in Biological Sciences 409 or equivalent research laboratory facilities will be provided by Florida Technological University Department of Biological Sciences.

All equipment and space noted above are presently available in the Department of Biological Sciences except for the herbarium cases to house loaned specimens and the Wild Microscope and Drawing System. The University will deposit monies to the grant account in reimbursement for the cost of herbarium cases as specified. The Wild Microscope and Drawing System is requested from the Foundation because the Wild M-11 is designed to be portable and the accessory Drawing System is both easily installed for use, and allows the user to employ both eyes for the microscope while drawing, thus greatly reducing fatigue and enhancing productivity. Most institutions, especially in Europe, do not have microscopes for visiting investigators, and none is presently available at this institution to serve the principal investigator in this capacity, hence the importance of both ease of portability and the drawing system for the successful prosecution of the project. Anticipated continuing studies will utilize this equipment for many years to come.

Expendable Equipment and Supplies

Expendables include computer cards, microscope slides, boxes and cover slips, drawing board and supplies, chemicals for slide preparations, gas for the freezing microtome, annotation labels, and xerox charges for interlibrary loans.

Publication Costs

Journals selected for publication, such as The Bryologist, may have modest page and illustration charges. Reprints to be provided cooperating persons and institutions are requested.

Computer Costs

It is estimated that 10 hours of computer time on the University's IBM-375 system will come close to meeting our needs over the two year period.

Travel

By June, 1977, the research will have reached the point where the principal investigator and the non-faculty professional can best undertake the on-site study of the large collections (areas of specialization noted in parenthesis) held in the herbaria of the British Museum of Natural History (former colonies), the Manchester Museum (South America), the Museum National d'Histoire Naturelle in Paris (former colonies), the Conservatoire et Jardin Botanique in Geneva (world wide major collections), the Flora Malesiana Herbarium in Leiden (Malesia), the Botanical Institute in Copenhagen (Thailand and Holarctic regions), Naturhistoriska Riksmuseet in Stockholm (South Africa and South America), and the Botanical Museum of Helsinki University (worldwide). With two people working in close cooperation, tremendous progress can be anticipated and material can be selected for subsequent loan from the massive numbers expected to be available. Accordingly, round trip air fare is requested for two, plus a full per diem allotment for the principal investigator and half per diem for the non-faculty professional for a period of 75 days.

Domestic travel will be limited to an annual meeting of the American Bryological Society (1978) to report the results of work and research travel to the U. S. National Museum, New York Botanical Garden, and the

Farlow Herbarium of Harvard University. Economy air fare and 25 days of per diem are requested for the principal investigator only.

Personnel

The principal investigator, Henry O. Whittier, has been a student of bryology since 1960, when he travelled as botanist on the Miami University-schooner Collegiate Rebel Expedition to Panama, the Galapagos, the Marquesas, Society Islands, American Samoa, through the Caroline Islands to Palau, and reported upon the mosses of the atolls of Micronesia. He was an instructor of botany at the University of Hawaii between 1962 and 1964, and collected extensively on Oahu, with brief field trips to Kauai, Maui, and Hawaii. In 1964, he conducted additional bryological exploration on Tahiti and Moorea during a stay of more than three months duration, and moved to the New York Botanical Garden where he could complete doctoral research on Society Islands' mosses and study at Columbia University. In 1968, he joined the staff of the newly formed Department of Biological Sciences at Florida Technological University and continued bryological research. Field travel ranged from transcontinental trips by automobile to attend the International Botanical Congress in Seattle, to Association for Tropical Biology meetings in Mayaguez, Puerto Rico, and Beta Beta Beta National Honor Society meetings in Rio Piedras, with limited bryological exploration associated with each. The latter included field work on Pico del Este, in which he worked with his wife to carefully strip the corticolous epiphytes from a single cloud forest tree, mapping their

distributional extent as a contribution to studies already initiated for that region. Most recently (within the last two years), the principal investigator has conducted bryological field work in the San Jose-Escuintla-Antigua area of Guatemala, and along the northeast flanks of Auyan-tepui in the Canaima Park District of Venezuela. To the present, major publication efforts have been devoted to the completion of an illustrated, diagnostic guide to the mosses of the Society Islands, and to the preparation of preliminary catalogs of Pacific Islands mosses.

The non-faculty professional, Barbara Ann Whittier, has worked with the principal investigator on a professional basis since their marriage in 1971, contributing to the completion of his book on the mosses of the Society Islands, and collaborating jointly in the preparation of a preliminary list of mosses of southeastern Polynesia. More significantly, she has worked for the past four years on the development of a comprehensive catalog of tropical Pacific islands mosses, and will be a co-author when it is published in 1976/1977. She has accompanied the principal investigator on field expeditions in Florida, the western United States, Puerto Rico, and Guatemala. Her master's project, analysing the utilization of biology textbooks in the State of Florida, encompassed considerable time with university computer systems, and her expertise in this area is expected to contribute significantly to the success of this program of study.

CURRICULUM VITAE
OF
HENRY O. WHITTIER

Associate Professor
Department of Biological Sciences
Florida Technological University
Orlando, Florida 32816

Personal Information

Born: September 1, 1937. Schenectady, New York.

Marital Status: married to Barbara Ann Kohler Whittier.

Dependents: daughter, Rebecca Jo, age 10.

Degrees Earned

Ph.D. Biology. Columbia University, New York. 1968.

M.A. Botany. Miami University, Oxford, Ohio. 1961.

B.S. Ed. Biology. Miami University, Oxford, Ohio. 1959.

Ph.D. Dissertation Title

Mosses of the Society Islands: Preliminary studies on their taxonomy, ecology and geography.

Professional Experience

Teaching

Teaching Assistant, Department of Botany, Miami University, Oxford, Ohio, General Botany Laboratory-Lecture Program. 9/59-6/62 (part as research assistant).

Instructor of Botany, Department of Botany, University of Hawaii, Honolulu, Hawaii. General Botany, Plant Morphology, Flowering Plant and Tree Identification. 9/62-8/64.

Assistant Professor of Biological Sciences, Florida Technological University, Orlando, Florida. General Botany, Plant Geography, Plant Ecology, General Ecology, Plants and Man-Ethnobotany, Plant Taxonomy, Plant Anatomy and Histology, Field Botany, Local Flora, General Biology. Member Charter Faculty. 8/68-8/71.

Associate Professor of Biological Sciences, Florida Technological University, Orlando, Florida. Same teaching assignments with addition of Plants and the Urban Environment, a horticulture-landscape design course. 9/71-present. Wildflower course, John Young Museum and Planetarium Orlando, Public service. 1976.

Research

Research Assistant, Miami University, Oxford, Ohio. Collection and preparation of herbarium specimens. 1/60-8/62 (in part; some of this time was served as teaching assistant).

Research Assistant, Cryptogamic Herbarium, The New York Botanical Garden, as Botanical Illustrator for Drs. Stanley Greene (British Antarctic Survey) and William C. Steere (Director, The New York Botanical Garden), preparing drawings of Antarctic Musci. 9/64-8/65.

Research Assistant, Cryptogamic Herbarium, The New York Botanical Garden. General curatorial duties. 9/65-8/68.

Field Exploration

United States: general travel by automobile from Key West, Florida, to Los Angeles, California, to Seattle, Washington, Boulder Colorado, and Amherst, Massachusetts, to mention key points, with limited collecting and photography.

Miami University-schooner Collegiate Pebel Expedition to the South Pacific, as deck hand, cook and botanical field collector in the Galapagos, Marquesas, Society, Samoan and Micronesian islands. 2/60-9/60.

Hawaiian Islands: Oahu, Kauai, Maui, Hawaii. 9/62-8/64.

Society Islands: Tahiti and Moorea. 8/64-11/64.

Puerto Rico: Association for Tropical Biology meetings at Mayaguez, with field forays to rainforest and beach communities. 6/69. Pico del Este elfin forest ecological study on corticolous bryophyte associations. 1/75.

France and Switzerland: International Bryological Colloquium, Lille, France, 1972, with field forays in the vicinity of Lille, Dijon, and in the Jura of Switzerland, near Geneva. 1/73.

Florida and Georgia: directed 5-week program in field botany and natural history of Florida for university students. 6/73-8/73.

Florida: Brevard County bryological field studies conducted for National Aeronautics and Space Administration (NASA) at Kennedy Space Center as part of a solid rocket fuel air pollution survey. 2/75-9/75.

Guatemala and Mexico: field studies in the vicinity of Antigua, Guatemala, and along the Gulf Coast of Mexico. 7/75-8/75.

Venezuela: Guiana Highlands, Canaima Park District. 8-9/75.

Curaçao, Dutch Netherlands Antilles: living botanical specimens collected for teaching collections at Florida Technological University.

Other Responsibilities and Activities

Florida Technological University Faculty Senate. 1968-1970.

Advisor to Department of Biological Sciences Biology Club from inception in 1968 to its union with Beta Beta Beta National Biological Honor Society in 1973, and chapter sponsor until 1974.

Directed and participated in disassembly and reconstruction of 50 x 25 x 19 foot glass conservatory greenhouse for departmental use. 9/72-current.

Curator, the F.T.U. Herbarium. 8/68-present.

Chairman, Botany Option Program, 1968-1970; 1975-present.

Member, University Symphony Orchestra (flute and piccolo). 1971-1973.

Fellowships and Grants

<u>Date</u>	<u>Project Title and Agency</u>
August, 1964	Studies on Society Islands Mosses. Sigma Xi-RESA Grant-in-aid of research.
November, 1970	Florida Technological University Institutional Research Grant (National Science Foundation)
December, 1971	Florida Technological University Institutional Research Grant (National Science Foundation)
September, 1972	NSF Equipment Grant (supporting Environmental Studies at F.T.U.), National Science Foundation. H.A. Miller, principal investigator, J. Koevenig, and H. O. Whittier.
January, 1973	Florida Technological University Foundation, travel grant to attend the First International Bryological Colloquium in Lille, France.
February, 1975	National Aeronautics and Space Administration-John F. Kennedy Space Center Solid Rocket Project: systematic and ecological survey of bryophyta on Merritt's Island, Brevard County, Florida.
June, 1975	Florida Technological University Foundation Award for Herbarium Development.

Honorary and Professional Societies

Phi Sigma Biological Honor Society (Miami, Ohio); Beta Beta Beta National Biological Honor Society (Charter member, F.T.U. Sigma Iota Chapter), Chapter Advisor until 1974; The Society of the Sigma Xi (Columbia University, 1968), F.T.U. Club Charter Member, Club Vice-president, 1971, Club President, 1972.

International Association for Plant Taxonomy; American Bryological Society; British Bryological Society; Botanical Society of America; Pacific Science Association (Pacific Science Congress) Botany Committee/ subcommittee on Cryptogamic Botany; American Institute of Biological Sciences; Florida Academy of Sciences.

Non-professional Societies or Associations

The New York Botanical Garden Association; Audubon Society; John Young Museum Association.

Publications

1961. A Narrative Account of the Miami University-Collegiate Rebel Expedition to the Galapagos, Polynesia and Micronesia, 1960. Miami University, Oxford, Ohio.
1963. Mosses of the Atolls of Micronesia. Part II. In Bryoflora of the Atolls of Micronesia. Beih. Nova Hedwigia 11: 1-89, 2 tab., 31 pl. Parts I and III coauthored with H. A. Miller and C. E. B. Bonner.
1966. Book Review: Island Life by Sherwin Carlquist. The Garden Journal, The New York Botanical Garden. 16: 118.
1967. Mosses of the Society Islands: the genus Fissidens. The Bryologist 70: 76-93. With H. A. Miller.
1968. Mosses of the Society Islands: preliminary studies on their taxonomy, ecology and geography. Ph.D. Dissertation, Columbia University. Dissert. Abstr. 30: 532-533 B. August, 1969.
1971. Bryological Bibliography of the Tropical Pacific Islands. Pacific Scientific Information Center. B. P. Bishop Museum, Honolulu. Pp. 57. H. A. Miller, H. O. Whittier, R. M. del Rosario and D. R. Smith.
1973. Mosses of the Marquesas Islands, French Polynesia. Bryologist 76: 174-177.
1974. List of mosses of southeastern Polynesia. Bryologist 77: 427-446. H. O. Whittier and B. A. Whittier.
1974. Amphigenous Bryoflora of French Polynesia. Proc. Colloque "Problemes Modernes de la Bryology," Lille, France, Dec. 1972. Bull. Soc. Bot. France 121: 277-286.
1975. A preliminary list of Fijian mosses. Florida Scientist 38(2): 85-106.

1976. Bryophytes of Merritt's Island. In Ecological effects and environmental fate of solid rocket exhaust. Pp. 1-196. Office of Research and Graduate Studies, Florida Technological University, Orlando, Florida. Chapter 7: 90-139. With I. Jack Stout, D. R. Reynolds, and B. Madsen.
1976. Mosses of the Society Islands. Pp. i-x, 1-410, f. 1-101. Florida State University System Presses, Gainesville, Florida.

Accepted for Publication/in Press

List of hepaticae of southeastern Polynesia. Florida Scientist. With H. A. Miller.

Corticolous bryophyte associations in the elfin forest of Pico del Este. Journal of the Arnold Arboretum. H. A. Miller, senior author.

Floristic needs in the Pacific Basin-Bryophyta: Musci. Proceedings of the 13th Pacific Science Congress, 1975.

Prodromus florae muscorum Polynesiae. Cramer Verlag. H. A. Miller, H. O. Whittier and B. A. Whittier.

BARBARA ANN KOHLER WHITTIER

Department of Biological Sciences
Longwood High School
Longwood, Florida

Personal Information

Born: June 17, 1947. Albany, New York.

Marital Status: married to Henry O. Whittier.

Dependents: daughter, Rebecca Jo, age 10.

Degrees Earned:

M.A. Biology Education, Florida Technological University, Orlando. 1972.

B.A. Biology Education, Florida Technological University, Orlando. 1970.

Masters Thesis Title:

Biology texts Utilized in Florida Secondary Schools

Professional Experience

Undergraduate Herbarium and Library Assistant, Department of Biological Sciences, Florida Technological University. 9/68-6/70.

Biological Sciences Teacher, Lyman High School, Longwood, Florida. 8/70 - present.

Coordinator (unofficial) for 5-week Florida Natural History Program taught through Florida Technological University. July-August, 1972.

Co-instructor of 5-week Wildflower course taught at John Young Museum and Planetarium, Orlando, Florida. March-April, 1976.

Research

Non-professional research associate with Henry O. Whittier. 1970-present.

Field Exploration

United States southeast, southwest, north to Minnesota and New York, Puerto Rico, Guatemala and Mexico.

Honorary and Professional Societies

Beta Beta Beta National Honor Society (Charter member, Sigma Iota Chapter, Florida Technological University). Pacific Science Association. Florida Education Association.

Non-professional Societies or Associations

Audubon Society. John Young Museum and Planetarium association.

Publications

1975. Biology Texts Utilized in Florida Secondary Schools. Florida Scientist 38(1): 40-45.
1974. List of mosses of southeastern Polynesia. Bryologist 77: 427-446.
With Henry O. Whittier.

Accepted for publication

Prodromus florae muscorum Polynesiae. Cramer Verlag. With
H. A. Miller, and H. O. Whittier.

Bibliography

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- Reimers, H. 1954. Syllabus der Pflanzenfamilien. 12th ed. I Band. XIV Abteilung: Bryophyta, Moose. pp. 218-268. Gebrüder Borntraeger. Berlin.
- Sneath, P. H. A. and R. R. Sokal. 1973. Numerical Taxonomy. The principles and practice of numerical classification. W. H. Freeman and Co. San Francisco.
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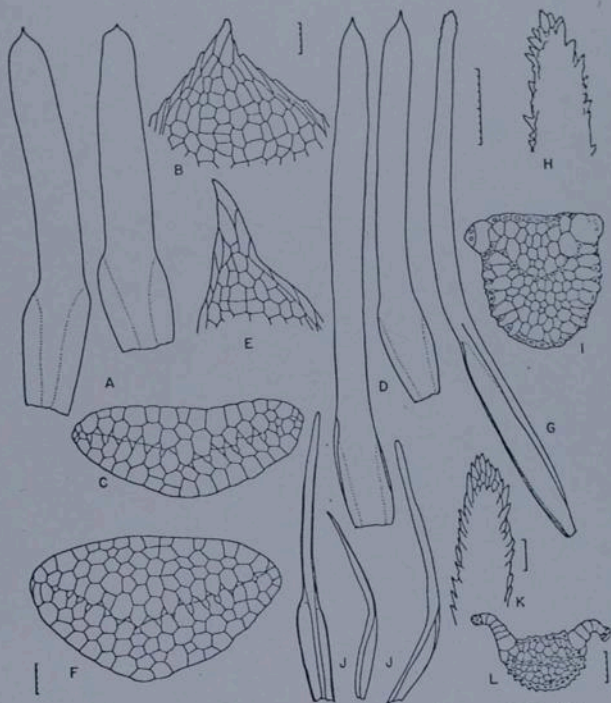


FIG. 26. A-C. *Octoblepharum albidum*. A. Leaves, scale 1 mm. B. Leaf tip, scale 50 μ . C. Cross section, leaf, scale 50 μ . D-F. *Octoblepharum longifolium*. (HOW 2110.) D. Leaves, scale 1 mm. E. Leaf tip, scale 50 μ . F. Cross section, midleaf, scale 50 μ . G-I. *Exodictyon dentatum*. (Nadeaud 46.) G. Leaf, scale 1 mm. H. Leaf tip, scale 50 μ . I. Cross section, midleaf, scale 50 μ . J-L. *Exodictyon nadeaudii*. (Hürlimann T 1192.) J. Leaves, scale 1 mm. K. Leaf tip, scale 50 μ . L. Cross section, upper leaf base, scale 50 μ . (del. HAM.)

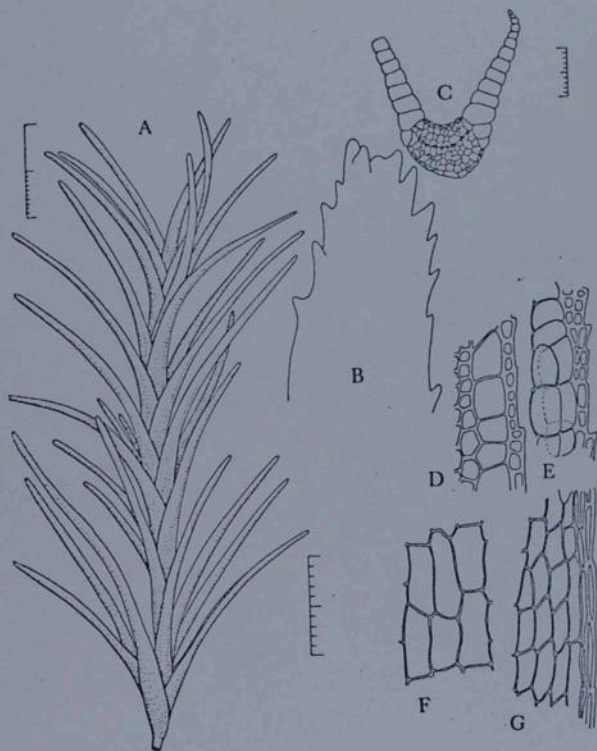


FIG. 27. *Exodictyon dentatum*. A. Habit, scale 2 mm. B. Leaf apex, outline to show denticulation. C. Cross section, leaf near base, scale 100 μ . D. Upper lamina cells. E. Leaf cells, lower one-third of lamina. F, G. Lamina cells, leaf base. D-G, scale 100 μ .

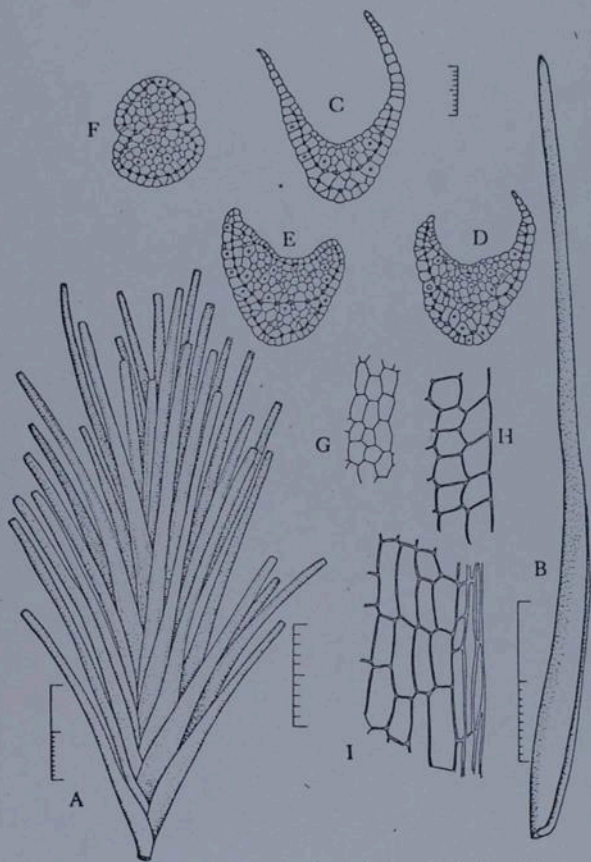


FIG. 28. *Arturocormus schimperii*. A. Habit, scale 2 mm. B. Leaf, scale 2 mm. C. Cross section, near leaf base. D, E. Cross section, lower one-third of leaf. F. Cross section, upper one-third of leaf. C-F, scale 100 μ . G. Median surface cells, upper leaf. H. Hyaline margin cells, lower one-third of leaf. I. Hyaline margin cells, extreme leaf base. G-I, scale 100 μ .

RESEARCH GRANT PROPOSAL BUDGET

Year Beginning March, 1977

Budget Category	NSF Funded Man-months Cal Acad Sum	Proposed Amount
A. SALARIES AND WAGES		
1. Senior personnel:		
a. (Co) Principal Investigator (list by name) <u>Henry O. Whittier</u>	<u>2</u>	<u>3,630.</u>
b. Faculty Associates (list by name) _____ (Sub-total) _____	_____ _____	_____ _____
2. Other Personnel (Non-Faculty)		
a. Research Assoc. (Post-doctoral) (list separately by name if available, otherwise give numbers) _____ _____	_____ _____	_____ _____
b. Non-Fac. Professionals (other) (list separately-by category, giving number, e.g. one computer programmer) <u>one technical assistant (B.A. Whittier)</u>	_____ _____ _____	<u>-0-</u>
c. (number) Grad Students (Res. Asst.)		_____
d. (1) Pre-Pacalalaureate Students		<u>700</u>
e. (number) Secretarial - Clerical		_____
f. (number) Technical, Shop & Other		_____
Total Salaries and Wages		<u>4,330.</u>

Budget Category	Proposed Amount
B. STAFF BENEFITS:	610.00
C. TOTAL SALARIES, WAGES AND STAFF BENEFITS (A+B)	4,940.00
D. PERMANENT EQUIPMENT: (List as Required)	
1. 1 Wild m-11 Microscope with drawing system	4,240.00
2. _____	
Total Permanent Equipment	4,240.00
E. EXPENDABLE SUPPLIES AND EQUIPMENT	600.00
F. TRAVEL:	
1. Domestic _____	
2. Foreign Round trip and per diem to Western Europe herbaria	3,550.00
Total Travel	3,550.00
G. PUBLICATION COSTS	200
H. COMPUTER COSTS (if charged as direct costs)	
I. OTHER COSTS: (Itemize by major type)	
1. _____	
2. _____	
3. _____	
Total Other Costs	-0-
J. TOTAL DIRECT COSTS (C through I)	13,530.00
K. INDIRECT COSTS:	
1. On Campus 52% of Salaries, Wages, and Benefits	2,569.00
2. Off Campus ____% of _____	
Total Indirect Costs	2,569.00
L. TOTAL COSTS (J plus K)	16,099.00
M. TOTAL CONTRIBUTIONS FROM OTHER SOURCES *	1,150.00
N. TOTAL ESTIMATED PROJECT COST	17,249.00
* Two all-steel herbarium cases to be purchased @ 325. each.	650.
Computer Time	500.

RESEARCH GRANT PROPOSAL BUDGET

Year Beginning March, 1978

Budget Category	NSF Funded			Proposed Amount
	Cal	Acad	Sum	
A. SALARIES AND WAGES:				
1. Senior personnel:				
a. (Co) Principal Investigator				
(list by name) <u>Henry O. Whittier</u>			<u>2</u>	<u>3,810.00</u>
b. Faculty Associates				
(list by name) _____				
(Sub-total) _____				
2. Other Personnel (Non-faculty)				
a. Research Assoc. (Post-doctoral)				
(list separately by name if available, otherwise give numbers)				

b. Non-Fac. Professionals (Other)				
(list separately-by category, giving number, e.g. one computer programmer)				
<u>one technical assistant (B.A. Whittier)</u>				<u>-0-</u>
c. (number) Grad Students (Res. Asst.)				
d. (1) Pre-Baccalaureate Students				<u>800.00</u>
e. (number) Secretarial-Clerical				
f. (number) Technical, Shop & Other				
Total Salaries and Wages				<u>4,610.00</u>

Budget Category	Proposed Amount
B. STAFF BENEFITS:	640.00
C. TOTAL SALARIES, WAGES AND STAFF BENEFITS (A+B)	5,250.00
D. PERMANENT EQUIPMENT: (List as Required)	
1.	
2.	
Total Permanent Equipment	-0-
E. EXPENDABLE SUPPLIES AND EQUIPMENT	500.00
F. TRAVEL:	
1. Domestic	975.00
2. Foreign	
Total Travel	975.00
G. PUBLICATION COSTS	200
H. COMPUTER COSTS (If charged as direct cost)	
I. OTHER COSTS: (Itemize by major type)	
1.	
2.	
3.	
Total Other Costs	-0-
J. TOTAL DIRECT COSTS (C through I)	6,925.00
K. INDIRECT COSTS:	
1. On Campus <u>52%</u> of Salaries, Wages, and Benefits	2,730.00
2. Off Campus _____ of _____	
Total Indirect Costs	2,730.00
L. TOTAL COSTS (J plus K)	9,655.00
M. TOTAL CONTRIBUTIONS FROM OTHER SOURCES *	500.00
N. TOTAL ESTIMATED PROJECT COST	10,155.00
* Computer costs \$500.00	
 Total Estimated Project Cost, Two Years	 27,404.00
Total Requested from NSF, Two Years	25,754.00

August 23, 1976

NATIONAL SCIENCE FOUNDATION

PROPOSAL RATING SHEET

Reviewer Dr. David J. Rogers
Professor
EPO Biology
University of Colorado
Boulder, Colorado 80309

Proposal No.: DEB 7682641
Investigator: JENSEN, Richard J.
Institution: Wright State Univ.
Please return to: Systematic Biology
If possible by: OCT 14 1976

Comments (Continue on additional sheet if necessary)

If this is to be a numerical taxonomic study, there should certainly be more discussion of the methods than the one paragraph on page 7. Mention that other successes with numerical taxonomy (same paragraph) does not justify this one. There is no indication that the P.I. knows what NTSYS contains, as a package, that would specifically apply in the two essentially separate studies that are proposed.

The P.I. has not indicated that the study of Quercus ellipsoidalis has any real relation or connection to that of Q. falcata. If this study is to be significant, then more than numerical and/or chemotaxonomic methods should be included - these methods are but means to an end of better classification, including typical taxonomic treatment - synonymy, typification, etc.

OVERALL RATING

- ☐ EXCELLENT
☐ VERY GOOD
☒ GOOD
☐ FAIR
☐ POOR

NSF Form 173, Jan 1976

Signature of Reviewer:

David J. Rogers

Other suggested reviewers (optional):

Verbatim but anonymous copies of reviews will be sent only to the principal investigator/project director on request. Subject to this NSF policy and applicable laws, including the Freedom of Information Act, 5 USC 552, reviewers' comments will be given maximum protection from disclosure.

Wright State University

76-82641



Dayton, Ohio 45431 513 873 2655

Department of Biological Sciences

Submission No. 77-12

August 23, 1976

RESEARCH PROPOSAL

to

Systematic Biology Program
Ecology and Systematic Biology Section
National Science Foundation
Washington, D.C. 20550

Title: Numerical and Chemotaxonomic Studies of
Two Problematic Taxa of Quercus Subg.
Erythrobalanus in the Eastern United States

Principal Investigator: Richard J. Jensen

Social Security No.: 408-72-0204

Department: Department of Biological Sciences

New Program: Amount Requested - \$26,866

Period: August, 1977 - August, 1979

Richard J. Jensen
Principal Investigator
Assistant Professor of
Biological Sciences

George Dimopoulos
Chairman
Department of Biological
Sciences

Brian L. Hutchings
Dean
College of Science and
Engineering

Howard E. Bales
Associate Director
Research Services

ABSTRACT OF THE PROPOSED RESEARCH

Quercus ellipsoidalis Hill and Q. falcata Michx. are two taxa of eastern North American red oaks which have proved highly problematic to field workers. Quercus ellipsoidalis, although of restricted range, is a highly variable species. This variation, apparently the result of hybridization with sympatric species of red oaks, has led to considerable speculation concerning the taxonomic status of this species. Quercus falcata, a wide ranging species, presents a different problem. While the Q. falcata taxon (s. lat.) is easily recognized, the question of whether this taxon represents one species with three or four varieties or simply two separate species has not been adequately answered.

It is the intent of this proposal to outline a research program designed to provide a definitive statement concerning the taxonomic status of these species. First, a numerical taxonomic study of morphological data will allow comparison of Q. ellipsoidalis with sympatric species of red oaks and comparison of the varieties of Q. falcata. Second, chromatographic studies of leaf and bark extracts of these taxa will allow qualitative and quantitative comparisons of phenolic constituents, both intra- and interspecifically. While either analysis alone would provide a good indication of the taxonomic status of these species, such a dual approach will permit more definitive conclusions.

NUMERICAL AND CHEMOTAXONOMIC STUDIES OF TWO PROBLEMATIC TAXA OF
QUERCUS SUBG. ERYTHROBALANUS IN THE EASTERN UNITED STATES

The genus Quercus (oaks) is represented in the eastern United States by approximately 28 species of two distinct subgenera, Lepidobalanus (white oaks) and Erythrobalanus (red oaks). While the two subgenera are quite distinct, there being several morphological and anatomical characters distinguishing them, the recognition of species within each subgenus is often highly problematic. Burger (1975) has presented a workable species concept for the oaks, emphasizing the rather broad morphological variability inherent throughout the geographic range of each species. This approach allows one to recognize each species as it occurs within a given area. Nevertheless, there are still some species and species complexes that are so variable as to cause doubt of the validity of their current taxonomic status.

Two such species are Quercus ellipsoidalis Hill and Q. falcata Michx., both of the subgenus Erythrobalanus. Each of these taxa has been the point of some confusion, although this confusion may be viewed as the product of a different set of circumstances in each case. The difference that is most readily apparent is in the geographical range of these taxa. Quercus ellipsoidalis is found only in the western Great Lakes Region of North America and is therefore of limited distribution. On the other hand, Q. falcata is rather widespread, occurring from Florida west to eastern Texas and southeastern Oklahoma and north to southern Illinois, southern Indiana, southern Ohio, and south-

what others?

ern New Jersey. Quercus falcata is apparently absent or rare in the Appalachian Region, thus its range is not continuous from New Jersey to eastern Texas but tends to follow the Coastal Plain and Piedmont around the Appalachians.

Quercus ellipsoidalis, although of restricted range, is a rather poorly defined species. Wadmond (1933) has chronicled the confusion that existed prior to the description of Q. ellipsoidalis as a species by Hill (1899). Before that time both Q. coccinea Muenchh. and Q. palustris Muenchh. were reported from Wisconsin and Minnesota, yet the specimens so labeled were unlike those of either of these taxa collected to the south and east. Wadmond (1933) felt that specimens from Wisconsin, Minnesota, northern Iowa, and northern Illinois labeled Q. coccinea and Q. palustris were probably Q. ellipsoidalis, suggesting that neither of the former two taxa was native to those areas.

Quercus ellipsoidalis is often confused with three other taxa of Erythrobalanus which are sympatric with it. In the western part of its range Q. ellipsoidalis may be found growing in association with Q. rubra L. and Q. velutina Lam. and to the east Q. palustris is added to this list (especially in southern Michigan). This confusion may be the result of hybridization. Palmer (1948) discussed the hybrid produced by Q. ellipsoidalis x Q. velutina and Swain (1972) studied hybridization between Q. ellipsoidalis and Q. rubra. Overlease (1964), after studying various populations of red oaks, along a north-south gradient through Michigan and Indiana, concluded that Q. ellipsoidalis demonstrated considerable gene exchange with Q. palustris, Q. rubra, and Q. velutina. Overlease (1964) also pointed out that some

populations contained trees that could best be described as belonging to a Q. coccinea-Q. ellipsoidalis complex.

Overlease (1964) presented two hypotheses to account for the observed relationships. His first hypothesis was that the type population of Q. ellipsoidalis may have arisen through hybridization of Q. palustris and Q. velutina. He noted that individuals assignable to the Q. ellipsoidalis taxon were growing in intermediate areas between poorly drained Q. palustris sites and well drained Q. velutina sites. It is noteworthy to point out that Camp (1934) reported the finding of an oak in southern Ohio, originally identified as Q. palustris x Q. velutina and thought by Camp to be Q. coccinea, that was indistinguishable from Q. ellipsoidalis. While this locality is well south of the accepted range of Q. ellipsoidalis, the original identification corresponds to Overlease's (1964) comments on the possible hybrid origin of this taxon. However, Overlease (1964) favored the second of his two hypotheses, i.e. based on the apparent clinal variation in characters Q. ellipsoidalis is, in reality, a small fruited northern variety of Q. coccinea.

Jensen (1975) found support for the first of Overlease's (1964) hypotheses. First, numerical analysis of a population of red oaks from Wisconsin, including Q. ellipsoidalis and Q. velutina, did not allow separation of these taxa. Second, numerical analysis of a population from Michigan, including Q. ellipsoidalis, Q. palustris, and Q. velutina, demonstrated a continuum including all three taxa (in each of the above populations OTU's of Q. rubra formed distinct clusters).

Jensen (1975) concluded that there are two equally plausible explanations for the Q. ellipsoidalis problem. One is that Q. ellipsoidalis may be the remnant of a species that is nearing extinction or that is being absorbed, through introgression, into other species. The second is that what is now called Q. ellipsoidalis is a recent evolutionary offshoot, through hybridization of Q. palustris, Q. velutina, and possibly Q. coccinea, which is still in the formative stages. The latter alternative is intuitively considered the more probable.

The Q. falcata problem is of a rather different nature. The question at hand concerns the proper classification of a well-defined taxonomic entity. Individuals assigned to the Q. falcata taxon are easily recognized as such, yet there is considerable variability within this taxon. Quercus falcata is treated as being composed of two varieties (Q. falcata var. falcata Michx. and Q. falcata var. pagodaefolia Ell.) by Gleason (1952) while Fernald (1950) adds a third (Q. falcata var. triloba [Michx.] Nutt.). Harlow and Harrar (1950) recognize the former two, add a third (Q. falcata var. leucophylla [Ashe] Palmer and Steyererm.), and do not include var. triloba.

Ware (1967) studied the Q. falcata complex and concluded that two species be recognized, Q. falcata Michx. (including Q. falcata var. triloba) and Q. pagoda Raf. (combining Q. falcata var. pagodaefolia and Q. falcata var. leucophylla). Jensen (1972) agreed with Ware's (1967) treatment because 1) leaves ascribed to Q. falcata var. triloba are commonly found on trees with typical leaves and 2) Q. falcata var. pagodaefolia, besides

differing morphologically, is apparently segregated ecologically from Q. falcata var. falcata as well. The conclusions made by Ware (1967) and Jensen (1972) are in agreement with Trelease's (1924) treatment of these taxa. Nevertheless, a more detailed analysis is necessary to further clarify the relationships of these taxa.

It is the intent of this proposal to suggest means by which both of these problems may be resolved. Jensen (1975) and Jensen and Eshbaugh (1976a, b) have had notable success in utilizing numerical taxonomy as an analytic tool for studying oak populations. Relying almost solely on morphological data we were able to demonstrate the apparent lineage of individual oaks of putative hybrid origin. These analyses also have led to a suggestion of the phylogenetic relationships of various taxa of Erythrobalanus. Numerical taxonomy is thus considered an especially useful means of examining populations of oaks containing individuals of questionable relationships. It should be pointed out that one of the most comprehensive numerical taxonomic computer packages, NTSYS (Rohlf et al., 1974), has been installed at the Wright State University Computer Center.

Another systematic tool to be considered is the study of phenolic compounds through paper chromatography. I am aware of three studies directly involving oaks. In 1960 Zamierowski used one-dimensional paper chromatography to study hybridization between three taxa of Erythrobalanus. The presence or absence of various phenolic constituents was assumed to support morphological evidence that indicated hybridization. Although some

preliminary attempts to duplicate Zamierowski's (1960) methods were only marginally successful, I feel that the potential usefulness of this approach merits further attention.

Two other studies, both by Li and Hsiao (1974, 1974/1975), utilized two-dimensional paper chromatography of leaf phenolics to evaluate relationships in both subgenera of Quercus. Li and Hsiao (1974) found a total of 62 spots, some found in all taxa and others occurring only in particular species or groups of species (series). Furthermore, analyses of two hybrid individuals allowed speculation as to what the parental species were. Li and Hsiao's (1974/1975) second study was restricted to two series, Nigrae and Laurifoliae, of Erythrobalanus. Their data indicated that a revision of the classification of these taxa may be in order.

In order to accumulate specimens to be used in numerical studies it is necessary to collect leaf, twig, fruit, and bark materials of each individual to be analyzed. Such collections must be made at a time when the developing fruits, as well as buds, have reached maturity. This can be accomplished by delaying collecting until early September. If it becomes desirable to prepare collections of newly developed leaves, as this may be necessary for producing good chromatographic results, additional collections will be made in the spring or early summer. Trees sampled in the fall will be marked in such a way that it is possible to correlate materials collected at different seasons.

It is hoped that the collections of acorns can also be used for propagating a series of offspring from selected parent

plants. This would be especially useful for studying the varieties of Q. falcata. When these are grown under similar conditions the effects of environmental responses may be eliminated. The seedlings may then be analyzed, by any of several techniques, for both intra- and intervarietal variability.

The location of some of the populations to be sampled has already been determined. For Q. ellipsoidalis populations have been located at or near Bay City and Tawas, Michigan, Elkhart, Indiana, and Blanchardville, Wisconsin. I would also plan to collect as near as possible to the type population, near Calumet, Illinois, as well as locate additional populations. For Q. falcata collecting sites have been located in southern New Jersey, south-central Ohio, southeast Missouri, and Middle Tennessee. The location of additional sites would present no problem.

Since the proposed research is aimed at clarifying the status and relationships of two distinct taxa, it is only natural that the research be conducted in two distinct phases. Phase 1, August 1, 1977 to July 31, 1978, would emphasize collection and analysis of Q. ellipsoidalis. Phase 2, August 1, 1978 to July 31, 1979, would emphasize collection and analysis of Q. falcata. This format allows conservation of travel time and will permit a more ordered approach to the study of these taxa.

I feel that analyses such as those proposed herein will clarify the relationships of some of our native oaks. The results of such studies will perhaps indicate the origin and status of the included taxa. Since Quercus is, both ecologically and economically, the most important genus of hardwoods in the United

States, studies that clarify the relationships of these organisms will greatly aid our understanding and future use and management of this valuable natural resource.

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Biographical Sketch of Principal Investigator

Name:	Richard Jorg Jensen
Birth date:	January 17, 1947
Marital status:	Married to Faye Robertson Jensen; no children
Educational History:	B.S. in Biology, Austin Peay State University, Clarksville, Tennessee; May, 1970 M.S. in Biology, Austin Peay State University, Clarksville, Tennessee; August, 1972 Ph.D. in Botany, Miami University, Oxford, Ohio; June, 1975
Professional History:	Sixth Grade Teacher, Community School, Unionville, Tennessee; February-May, 1970 Science Teacher, Alice Drive Junior High, Sumter, South Carolina; August, 1970-June, 1971 Graduate Assistant, Department of Bio- logy, Austin Peay State University; September, 1971 - May, 1972 Teaching Fellow, Department of Botany, Miami University; September, 1972 - June, 1974 Dissertation Fellow, Department of Botany, Miami University; September, 1974 - June, 1975 Assistant Professor, Department of Bio- logical Sciences, Wright State Uni- versity; September, 1975 - Present
Professional Memberships:	American Society of Plant Taxonomists; Botanical Society of America; Inter- national Association of Plant Taxono- mists; Phi Kappa Phi; Sigma Xi; Tenne- ssee Academy of Science

Professional Awards:

Research Grant GB-40637, NSF, October, 1973
Grant in Aid of Research, Sigma Xi, June, 1974
Research Grant #1, Willard Sherman Turrell Herbarium Fund, Miami University, June, 1974

Publications:

Jensen, R. J., and E. W. Chester. 1973. A taxonomic and ecological study of Fagaceae of the Northwest Highland Rim. Jour. Tenn. Acad. Sci. 48: 50 (Abstract).
_____, and W. H. Eshbaugh. 1975. Phylogeny and equal weighting in numerical taxonomy. Jour. Tenn. Acad. Sci. 50: 48 (Abstract).
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Chester, E. W., L. J. Schibig, and R. J. Jensen. In Press. The woody flora of Land Between the Lakes, Kentucky and Tennessee. In: Jour. Tenn. Acad. Sci.
Jensen, R. J. A preliminary numerical analysis of the red oak complex in Michigan and Wisconsin. Submitted to Taxon.

Presentations:

Jensen, R. J., and E. W. Chester. A taxonomic and ecological study of Fagaceae of the Northwest Highland Rim. Tenn. Academy of Science, November, 1972.
_____, L. J. Schibig, and E. W. Chester. The forest communities of the Northwest Highland Rim, Kentucky and Tennessee. International Geobotany Conference, March, 1973.
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_____. Numerical taxonomy and hybridization in *Quercus*. Ohio Academy of Science, April, 1975.

_____. Numerical analyses of selected red oak populations. Tenn. Academy of Science, November, 1975.

_____. Comparison of classical, numerical, and chemotaxonomic relationships of eastern North American red oaks. Ohio Academy of Science, April, 1976.

Equipment and Research Facilities Available

Laboratory and office space has been provided in the Biology Hall at Wright State University. The Department of Biological Sciences has recently purchased five herbarium cases which will be utilized for storage of collected plant materials and loan specimens. Additionally, the department has agreed to purchase two of the principal items of equipment needed for the proposed research; a chromatography cabinet and a flash evaporator. Other items that may be needed, such as a spectrophotometer, are already on hand in the department. Computation facilities are available at the Wright State University Computer Center and a small greenhouse is available for the growth of seedlings.

BUDGET

<u>Salaries and Wages</u>	<u>Total Man Months</u>	<u>First Year</u>		<u>Second Year</u>	
		<u>NSF</u>	<u>WSU</u>	<u>NSF</u>	<u>WSU</u>
Principal Investigator: Richard J. Jensen					
Academic Year, 9 mo.+9 mo., 10%	2.0	\$ 1342	\$ 1342	\$ 1409	\$ 1409
Summer Quarter (2 mo.), 100%	4.0	2982		3131	
Student Assistants 300 hrs./yr. @ \$2.20/hr.		660		660	
Total Salaries and Wages		\$ 4984	\$ 1342	\$ 5200	\$ 1409
<u>Fringe Benefits</u>					
Principal Investigator, 15% of salary		\$ 649	\$ 201	\$ 681	\$ 211
Total Fringe Benefits		\$ 649	\$ 201	\$ 681	\$ 211
<u>Permanent Equipment</u>					
Stereomicroscope		\$ 516			
Illuminator		47			
Micrometer Disc		12			
Chromatography Drying Cabinet		1550			
Chromatograph Viewing Cabinet		399			
Chromatograph Sprayer		29			
Camera - Konica Autoreflex T3		520			
Total Equipment		\$ 3073			
<u>Expendable Supplies</u>					
Chromatography paper, solvents, glassware, photographic supplies, greenhouse supplies, etc.		\$ 400		\$ 150	
Total Supplies		\$ 400		\$ 150	
<u>Travel - Out of State</u>					
Field travel - 3000 mi./yr. @ \$0.12/mi.		\$ 360		\$ 360	
Per Diem - 68 days @ \$35.00/day		1190		1190	
Total Travel		\$ 1550		\$ 1550	
<u>Computer Time</u>					
50 runs @ \$10.00/run		\$ 250		\$ 250	
Total Computer Time		\$ 250		\$ 250	
<u>Publication Costs</u>					
Plate preparation, excess pagination, reprints, xeroxing of literature and rough copies, mailing costs, etc.		\$ 500		\$ 500	

<u>Publication Costs</u> (cont'd)	<u>First Year</u>		<u>Second Year</u>	
	<u>NSF</u>	<u>WSU</u>	<u>NSF</u>	<u>WSU</u>
Total Publication Costs	\$ 500		\$ 500	
	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Total Direct Costs	\$11406	\$ 1543	\$ 8331	\$ 1620
Indirect Costs, 70% of Salaries and Wages	<u>3489</u>	<u>939</u>	<u>3640</u>	<u>986</u>
Total Costs	\$14895	\$ 2482	\$11971	\$ 2606

Total Requested of NSF	\$26866	84%
Total Contributed by WSU	<u>5088</u>	<u>16%</u>
Total Cost of Program	\$31954	100%

BUDGET EXPLANATION

Salaries and Wages

The principal investigator is asking for two months summer salary for 1978 and 1979. My teaching schedule during the academic year is anticipated to consist of one 4 or 5 hour course and one seminar per quarter. Based on this anticipated teaching load I feel that I can devote approximately 20% of my time to the proposed research.

Student assistants will be needed to catalog specimens, prepare labels, mount specimens, and oversee the culture of seedlings. Although I have no particular students in mind, I feel that I can find fully qualified students from among our undergraduate or graduate biology majors.

Permanent Equipment

The items requested are considered essential for conducting both morphological and chemotaxonomic studies. A desk stereomicroscope, with illuminator and micrometer, must be utilized for examination of large specimens that cannot be viewed under a conventional stereomicroscope, e.g. mounted herbarium specimens. While the Department of Biological Sciences is purchasing some of the equipment necessary for chromatographic studies, the items listed herein are required for controlled drying, spraying, and ultraviolet viewing of chromatograph sheets. Finally, a camera for photographing trees in their natural habitat, to record the appearance of the outer bark and growth habit, is considered a necessity.

Expendable Supplies

Included under expendable supplies are such items as chromatography paper, solvents for extracting and developing, reagents for identifying compounds, glassware for extraction and storage of plant materials, such greenhouse supplies as are needed, and the costs of purchasing and developing film. It is difficult to determine the exact cost of these supplies due to such factors as breakage and the need to perfect the methods of chromatographic analysis.

Travel

A variety of collecting sites will be visited during the course of the proposed research. Each site will be visited once in the fall and, the trees having been marked, again during the following late spring-early summer. The total estimated time

for field trips is three weeks (20 days) in the fall and two weeks (14 days) in late spring-early summer. Expenses are based on a \$35.00/day allowance to cover living expenses and a current charge of \$0.12/mile for a University vehicle.

Computer Time

Data will be analyzed with programs contained in the NTSYS computer package. The principal investigator's previous experience with this package suggests that an average cost of \$10.00 per run is reasonable. As few, if any, computer runs are successful the first or second time around, the principal investigator feels that 25 runs per year will allow adequate computer time to get the data analyzed and for subsequent manipulations that may be warranted. The Wright State University Computer Center is equipped with an IBM 360/65 machine. The following rates are in effect at the Computer Center:

Cards read	\$.001 each
Lines printed	.001 each
Cards punched	.005 each
CPU usage	.030 per second
Memory usage	.002 per K bytes per minute, determined by job class
Disk and tape I/O	.001 per block

24 1976

The University of Reading

Professor of Agricultural Development Overseas:
A. H. Bunting CMG MSc DPhil LLD FIBiol

Plant Science Laboratories
University of Reading
Whiteknights
Reading England
RG6 2AS

Your ref:

A/823.4041

Telephone: (0734) 85123 Ext: 7907

Our ref:

Airmail

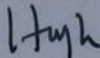
Telex No. 847813

10 August 1976

Dear David, Gil and Jay,

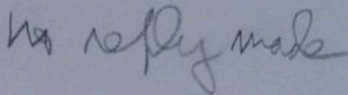
When David, Gil and I were together in Washington recently, David and Gil suggested that it would help Taxlab and its staff if (as a member of IBPGR and chairman of the advisory committee) I were to spend some time with you all, thinking and talking about the future, and maybe the past and present too. It would of course be very useful indeed to me to do this, in preparation for the next meeting of the Executive and of the committee, and I should I am sure enjoy it, but the cost would not be peanuts either in time or in money. I should therefore be most grateful if each of you would send me a note, as personal as you like, listing what you would like me to do, see and discuss if I were to come to Boulder, and how long you think it would take, so that I may balance it all up and consult Dick Demuth.

Yours ever,



A. H. Bunting
Professor

Professor D.J. Rogers, Dr. G.N. Herish, Dr. J.E. April,
Taximetrics Laboratory,
University of Colorado,
1229 University Avenue,
Boulder,
Colorado 80309,
U.S.A.



CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH

INTERNATIONAL BOARD FOR PLANT GENETIC RESOURCES

SECRETARIAT:

Crop Ecology and Genetic Resources Unit
Plant Production and Protection Division
FAO

Via delle Terme di Caracalla
00100 Rome, Italy

1156 15th Street, N.W.
Washington, D.C. 20005

June 29, 1976

Dr. David J. Rogers
University of Colorado
Taximetrics Laboratory
Department E.P.O. Biology
Boulder, Colorado 80302

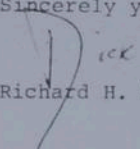
Dear Dave:

Would you be good enough to go over the attached statement which I have prepared for International Centres Week? It refers in several places to the GR/CIDS project and I would like to have assurance from you that what I have said about the project is correct. I would also appreciate knowing whether the users' manual has been published (or will be before Centres Week) and, if not, whether you can give me an approximate date for its publication.

Have you had any discussions with officials of the University since our last talk in Washington? If so, I would be very much interested in your present thinking about the future organization of the project.

With best regards,

Sincerely yours,


Richard H. Demuth

Enc.

DRAFT 8/20/76

DRAFT OF STATEMENT FOR INTERNATIONAL CENTRES WEEK

JULY 27, 1976

The International Board for Plant Genetic Resources has now been in existence for just over two years. During that relatively brief span we have begun, I think, to make perceptible progress towards our goals. Let me touch on some of the highlights:

1. The Board has agreed to an initial definition of its priorities which is embodied in a priorities paper that I believe has been distributed to each of you. Since this is a matter of basic importance to the Board's activities and one which the Board intends to keep under continuing review, we would greatly welcome comments and suggestions on this paper.

2. We have witnessed, and to some extent have stimulated, a considerable increase of exploration and collection activities designed to conserve the genetic variability of important plants which are in danger of erosion and to fill large gaps in existing germplasm banks. These activities include the collection of cereals and legumes in North Africa, organized by the Bari Germplasm Laboratory; the IITA Program for the collection of grain legumes, roots and tubers in West Africa; the CIAT collection of forage legumes in Latin America; the ORSTOM/ICRISAT collection of sorghum and millet in the Sahelian Zone in Africa; and a number of collecting expeditions in the countries of Southwest and South Asia.

3. A number of research institutes holding substantial germplasm collections which have remained largely unused and unusable because their contents were never effectively classified and recorded, have been taking first steps to evaluate and document their holdings so that the collections may become a useful resource in future breeding programs -- and the Genes Board, largely through the Taximetrics Laboratory of the University of Colorado, has been helping and encouraging them in this endeavor.

4. We have entered into active and mutually beneficial collaborative arrangements with the various International Centres -- and I want to take this opportunity to express, on behalf of the Board, our genuine appreciation for the cooperation we have received from the Centre Directors and their staffs. Most of the Centres have been quite willing to agree that they should, ^{/in cooperation with the Genes Board,} exercise global or regional responsibility, as appropriate, for coordinating genetic resources activities in connection with the crops for which they have been assigned primary research responsibility within the Consultative Group System. In particular, with the understandable exception of CIMMYT in the case of wheat, the International Centres have all accepted the IBPGR's invitation to organize and co-sponsor with us, Crop Germplasm Advisory Committees, whose charge it is to bring to bear on the Gene Board's work on each crop, the knowledge and experience

of the community of scientists working on the improvement of that crop. Thus, we have created a Rice Germplasm Advisory Committee in collaboration with IRRI; a Maize Committee in collaboration with CIMMYT; a Phaseolus Bean Committee in collaboration with CIAT; a Sorghum and Millet Committee in association with ICRISAT; and a Wheat Committee of which the IBPGR is the sole sponsor. We expect to receive from these Committees -- and from a few additional ones which may be established -- advice on such matters, among others, as the adequacy of existing collections, the major gaps to be filled, and the priorities for future collection efforts. We also look to the Advisory Committees for advice on the adequacy of conservation and evaluation programs and of programs for the exchange of information and materials. Furthermore, to facilitate the exchange of information, we look to the Advisory Committees to provide us with a list of the principal descriptors to be applied to each crop. If we can succeed in getting general international agreement on the descriptors to be used for each major crop, this will facilitate immensely the task of documenting collections and of arranging for the exchange of information and materials among the centres holding those collections. This, in the long run, will help to make available to breeders everywhere a whole range of genetic materials to which they have not heretofore had access.

over!

Among the Centres which have been collaborating closely with us is CIP, but in the case of potatoes CIP felt, and the Genes Board agreed, that no Germplasm Advisory Committee was necessary because CIP itself had the experience and expertise to advise the Board directly on potato germplasm matters.

5. We have been encouraging the International Centres to expand their own germplasm collections, where appropriate, and in some instances, have provided bridge financing to enable them to do so without delay. We have cooperated, for example, with CIAT in the development of its plans to collect grain legumes, roots and tubers in Africa; and with IRRI in the expansion of its germplasm bank by the collection of rice in Indonesia, Bangladesh and other countries. Long term, we and the Centres agree that these genetic resources activities are an integral part of the basic program of the Centres and should be financed through their core budgets -- and indeed the Centre budgets presented this week reflect the Centres' growing appreciation of the importance of expanding and more effectively utilizing their germplasm banks. This has been reflected organizationally in the creation of new Germplasm Units at IITA and CIAT, and in the development of a five-year plan, 1976-81, for the IRRI germplasm bank. Similarly, it is reflected in IRRI's new cold storage facility for its rice collection and in CIAT's decision to modify an existing cold storate facility, originally designed for meat, to provide long-term storage for seeds and tubers.

6. In addition to our cooperation with the International Centres, which generally relates to specific crops, we have been encouraging the development of regional programs for those regions which contain large genetic resources of a variety of important plants but where no adequate or systematic exploration and collection have been organized. Typical of these regions is Southwest Asia, Meso-America, and Ethiopia. In some regions, the approach has been primarily through the creation of a new regional genetic resources centre: perhaps the best examples of this are the new centres just being established, after considerable delay, in Turrialba, Costa Rica, and in Ethiopia, with the aid of financing from the Federal Republic of Germany. Both of these centres should be in full operation in 1977. In other regions, the approach has not been through creating a new institution but rather through promoting and assisting national genetic resources programs, coordinated to the extent necessary by a regional Board or Committee. This is true, for example, of Southwest Asia, where the IBPGR, on July 1 of this year, took over from the Swedish Government, at that government's request, responsibility for continued support of what has heretofore been known as the Regional Project on Exploration and Conservation of Plant Germplasm in the Near East. The Board intends to finance, in that region, a Genetic Resources Support Unit, the members of which will be responsible for assisting the countries of the

region in formulating and implementing their own national genetic resources plans. Duplicates of all seeds collected will be deposited in a regional collection held at Izmir, Turkey. Eventually, it may well be desirable for ICARDA to become actively involved in carrying out this program, in cooperation with the Genes Board, and we are formulating our plans for the region with this possibility in mind. Similar regional programs are in the process of formulation for Southeast Asia and for South Asia, in each case on the initiative of the countries of the region, and in each case, too, with some financial assistance from our Board.

7. I have already mentioned several important collecting activities sponsored by the Board in areas where genetic erosion is particularly threatened. In North Africa, the Germplasm Laboratory in Bari, Italy, has organized the collection of traditional varieties of wheat and barley which are being displaced by the spread of new varieties. In addition, there are important genetic resources of forage and grain legumes to be collected there. Similarly, in the Sahelian Zone of North Africa, the Board has arranged for ORSTOM, in cooperation with ICRISAT, IITA and IRAT, to collect, over a period of several years, native varieties of sorghum and millet which are threatened by the droughts which so often afflict that region.

8. Finally, I should mention our support of the information classification and documentation project being carried out for us by [the Taximetrics Laboratory] at the University of Colorado,

1 under the leadership of Professor David Rogers. The work of the
2 Colorado team has progressed to the point where the genetic
3 resources information system developed by it -- known as EXIR --

4 is now ready for general application in any centre having, or
5 having access to, computer facilities of a certain size -- and a

6 User's Manual ^{will} ~~is being~~ ^{shortly} ~~has been~~ issued to facilitate this. OK

7 In the months ahead, the work of the Colorado team will be
8 concentrated largely on the provision of advice, training and

9 technical assistance in the formation of genetic resources

10 data bases in those agricultural research centres having important

11 germplasm collections, enabling them, with relatively unsophisticated

12 computer facilities, to use the EXIR system for locating

13 accessions in their collections with defined characteristics --

14 and to communicate quickly and effectively with other collectors

15 and users with whom an exchange of information and materials

16 is essential. I

17 An important development in connection with this information
18 management project during the past year has been the creation of a

19 small, high level Advisory Committee to advise both the director

20 of the Taximetrics Laboratory which is implementing the project

21 and the Board which is financing it. That Committee held its

22 first meeting in Boulder, Colorado in April, and a report of

23 that meeting has been circulated to you together with our Programme

24 and Budget Proposals. In brief, the Committee concluded that

25 the EXIR scheme is technically sound and very effective, that its

Grows as stable EXIR

operational requirements are not unduly complex for the prospective users, and that no elaborate network of computer installations is necessary for its use. Dr. Hugh Bunting, a member of our Board, serves as Chairman of the Advisory Committee and he is present today to answer any questions which any of you may have about this project.

* * * * *

Now just a few words about our budget proposals. For reasons explained in our Programme and Budget presentation, our estimated expenditures for the current year will be considerably less than the amount budgeted -- so the 1977 budget, although only marginally larger than the budget approved for 1976, represents an increase of some \$300,000 over our estimated expenditures for the current year. As explained in our presentation, there are two major reasons for the increase: First, the deferral to 1977 of some priority collection, exploration and conservation activities originally expected to be ready for financing in 1976; and second, support of the Southwest Asia program for the full year 1977 instead of the 6 months covered by our 1976 budget.

Our budget is small compared to that of the other agencies within the Consultative Group System because our function is

primarily one of stimulating and coordinating genetic resources activities financed from other sources, rather than funding such activities ourselves. But our experience has demonstrated the wisdom of the Consultative Group's decision to provide the Board with a modest central fund of its own so that it can back its advice, in appropriate cases, with financing -- and can support some essential activities, such as the information and documentation project, which could not otherwise be readily financed. We have sought -- and I believe successfully -- to keep our claim on Consultative Group funds as small as possible -- but small as the budget presented to you may be, its full funding is, I am convinced, essential to the achievement of our task.

look
anther
to further
question.

file

July 12, 1976

Mr. Richard H. Demuth
Surrey, Karsaik & Morse
1156 15th Street, NW
Washington, DC 20005

Dear Dick:

Your letter of June 29, 1976 with your prepared statement for TAC arrived last week. We have read it carefully, and can assure you that what you have said about the project is basically correct. There are, however, six points which we wish to clarify:

1. (refer to RHD statement - page 7, line 3) EKIR is a computer program which is currently a primary operational tool for information management within the genetic resources information system (see AC report - page 12/13, point 58:1).
2. (refer to RHD statement - page 7, line 6) The final release draft of the EKIR Users' Manual is now being typed and edited. Perhaps it will be available for Centers' Week; if not, certainly within a few weeks.
3. (refer to RHD statement - page 7, line 7-16) We are also involved in working with the Crop Advisory Committees (especially maize and wheat) to pull together what the AC report refers to as Library of Genetic Resources Information on a crop basis (see AC report - page 9, item 42). Included in this is the development of methods and information for the Crop Advisory Committees to study and recommend "... descriptors to be used for each major crop" (RHD statement - page 3, line 17). And in fact, has been requested by the Maize Advisory Committee and CDEMYT. It is possible that the first draft publication of the information in the international "maize library" will be ready within the first quarter of 1977.
4. (refer to RHD statement - page 1, paragraph 2) Based on the recommendation, the Leningrad Wheat Workshop and the FAO/Wheat Advisory Committee suggestion that we work on several of these recommendations, we will be assisting in providing the documentation and data flow from the work of field collection to the

"international crop library." Such procedures will assure that germplasm maintenance is controlled through immediate data flow from point of collection and very early advice to the World Genetic Resources community on the availability of newly collected germplasm. This includes the design and use of forms working with standard minimum wheat collection descriptors.

5. (refer to RHD statement - page 7, line 11) The use of the phrase "... relatively unsophisticated computer facilities" may cause some trouble since "sophistication" is a loaded term. Small desk model "computers" with a core of 1K - 32K bytes are "too unsophisticated"; minicomputers with a disk operating system, a tape drive, a card reader, and a printer with a core of 64K bytes to 126K bytes is "sufficiently sophisticated." And EXIR will work well on larger, more complex computer systems.

6. (refer to RHD statement, - page 7, last line) "... the EXIR scheme ..." EXIR, the computer program was determined to be technically sound and very effective (AC report - page 12/13, point 58:1); and the AC also found that major components of the GR/CIDS "scheme" to accord satisfactorily with the goals and objectives of IBPGR (see AC report - page 13, point 59).

In reading the last section of the statement, a problem came to mind concerning the funding of our work in 1977. As proposed to the Board and FAO, we project our needs in calendar year 1977 at \$465,000. The increase due over previous year to the usual cost increments within any institution. The scope of work was presented, as it is now, as an integral operation to carry out, in fact, much of what the AC has suggested in spirit and scope. It is unclear as to whether FAO will honor its earlier commitment to cover its share of the program (\$67,000). Should FAO not be in a position to provide these funds, is there some mechanism through which the IBPGR can? The loss of this amount would be most destructive to the integrity of our pursuing the GR/CIDS program. This is especially true given certain important recommendations of the Advisory Committee.

The discussion with University officials here are going well and are encouraging. Shortly we will be able to present to you (and the AC) some of our thinking on the future organization of our project; but at the moment, I am deeply worried and preoccupied by the possible loss of funds due to FAO's non-participation in our very highly integrated GR/CIDS work.

Sincerely yours,

David J. Rogers
Director

DR:rs

David

201110

cc: Bommer
Albani
Pichel
Sykes
Williams
Rogers
Bennett
AGPE-IBPGR
AGP Reg (2)
Chrono: alz

PR 3/11 IBPGR Gen.

To: The Chairman and all
members of IBPGR

From: R.J. Pichel
Secretary

Date: 23 July 1976

I have pleasure in enclosing for your information the following:

- Minutes of the IBPGR fifth Executive Committee meeting (17-18 May 1976)
- Information Brochure on the IITA Germplasm Collection Unit
- The International Peanut Program Newsletter No. 1
- "Underexploited Tropical Plants with Promising Economic Value"
published by the National Academy of Sciences, U.S.A.



23 July 1976

Restricted to
IBPGR members

INTERNATIONAL BOARD FOR PLANT GENETIC RESOURCES

Fifth Executive Committee Meeting
Rome, 17 and 18 May 1976

MINUTES

1. The following members of the Executive Committee were present: Messrs. Demuth (Chairman), Bunting, de Bakker, Joshi and Kugler. Dr. Bommer (ADG, AG) also attended. The agenda as amended was adopted (Appendix I).

REPORT ON CURRENT ACTIVITIES

Bananas

2. Mr. Bunting reported on preliminary correspondence with Mr. K. Shepherd of Jamaica about the Lae collection in Papua/New Guinea. It was agreed that the Chairman would write to Sir John Crawford to say that when recommendations are available, the Board will consider these as part of the Board's activities on the genus *Musa*. The Board may request either Mr. N. Simmonds or Mr. K. Shepherd to visit Lae at a future date.

European network of genetic resources centres

3. The Secretary outlined developments in connection with this cooperative project since his report to the meeting of the Board in February. UNDP/FAO missions had visited EEC Headquarters in Brussels to seek Community support in March 1976, and the French Ministry of Foreign Affairs, INRA and OECD in April 1976. A further UNDP/FAO mission will visit USSR at the beginning of June. In August a UNDP/FAO/EUCARPIA/IBPGR meeting will be held in Warsaw to discuss the project document, which will be drafted by FAO/UNDP in Geneva in June 1976. This should enable a coordinator to be appointed in autumn 1976, provided UNDP funds are available.

4. It was agreed that FAO should suggest to UNDP that IBPGR be invited formally to co-sponsor the European regional programme, in which case Mr. Brezhnev as well as Mr. Kähre should be asked to represent the Board. In the event that Mr. Brezhnev is unable to do so himself, the Board would suggest that he could delegate responsibility to Mr. Budin. The project document should be sent to the Board for comments. It could be reviewed at the next Executive Committee meeting.

Mediterranean regional programme

5. The Secretary reported on negotiations in Greece and Algeria and the exploration planned for wheat, barley and pasture legumes in Tunisia and Algeria in June/July 1976. Further negotiations with other governments will take place as soon as feasible. Collecting missions for 1977 are already being planned, one of them with the cooperation of the Cereal Institute, Thessalonika, Greece. Mr. Bunting requested that collecting in the less developed parts of Spain and Portugal should include all material of New World origin, especially varieties of maize. In addition, the Laboratory in Bari is fulfilling a training role e.g. for a Greek national in documentation at the end of 1976.

Southwest Asia regional programme

6. The present SIDA-funded project terminates on 30 June 1976, but SIDA has agreed that funds can be committed before that date for capital equipment and training which may be installed or take place after this project terminates. The Secretariat is to enquire from Sweden if their 1977 contribution will be increased by an amount equivalent to that previously provided for the Regional Project and if that additional contribution will be restricted core.

7. The Committee approved the recommendations contained in Mr. Bunting's letter of 2 April to the Turkish Government. The Secretariat was requested to telex the FAO Representative asking him to speed up a reply. Assuming a positive reply is received, Iran should be approached promptly and if necessary Messrs. Bunting and Kähre should visit Iran. In the meantime Mr. Bunting will write to the Iranian Deputy Minister of Agriculture proposing that the Institute at Karaj would be a suitable base for the Eastern wing of the GRSU, and in addition he will enquire if suitable living quarters are available at Karaj for two experts.

8. The Committee was unanimous that the new programme funded by the Board should be put into operation as soon as possible. Since the present project document will no longer be effective, it was agreed that the countries would be advised that IBPGR intends to continue support of genetic resources

activities in Southwest Asia and, until there is agreement to a new project document, the Board would want to extend the existing one and hold a meeting not later than October 1976 to agree on the new document. The search for scientific personnel for the GRSU is urgent, and Messrs. de Bakker and Bunting will assist the Secretariat in the selection of candidates.

Reports of Crop Advisory Committees

9. The Rice Advisory Committee met at IRRI, 9 and 10 April, and Mrs. Sastrapradja represented IBPGR. The dates for meetings of the other crop committees are: maize, 27-28 May (with Mr. Roberts to represent IBPGR); wheat after 20 September (Mr. Fischbeck to represent IBPGR); sorghum/millet, September-October (Mr. Joshi to represent IBPGR); and Phaseolus beans in October (Mr. Roberts to represent IBPGR).

10. It was agreed that the Chairmen of all Crop Committees should be informed that the descriptors for the particular crop need to be agreed as soon as possible and that these should represent the opinion of the scientists in the field. In addition a representative of the Taxometrics Laboratory, Colorado, USA, should be invited by each committee to advise on GR/CIDS.

11. The minutes of the first meeting of the Rice Advisory Committee (AGPE: IBPGR/76/9) were tabled. These included a series of recommendations to the Board particularly on field collection, conservation and regeneration of seeds and the recording and distribution of data. The Executive Committee considered that the recommendations did not include an action programme, and the Secretariat was requested to write to the Chairman of the Rice Committee to clarify who will conduct the collection missions, when they will be conducted and whether IBPGR support would be needed. Moreover no statement of urgency was included in the report in the light of what has already been collected. It was agreed that the Rice Committee should assemble a list of descriptors by correspondence and a second meeting arranged to agree on those but only if there were other substantial new items to discuss.

Advisory Committee on GR/CIDS project

12. The draft report of the first meeting of the Advisory Committee on the GR/CIDS project (AGPE:IBPGR/76/7) was tabled. There was unanimity of view amongst participants as to the value of the role played by GR/CIDS in fulfilling the objectives of the Board. The Chairman of the Advisory Committee, Mr. Bunting, explained that the report still needed the comments of two members of the Advisory Committee, but should be in final form within a month. It was agreed that when revised the report should be circulated to all Board members and the CG along with the Programme and Budget Proposals for 1977.

13. The draft report generated considerable discussion, particularly in relation to development, transfer and execution of GR/CIDS. There was very general agreement by the Executive Committee with the recommendations of the Advisory Committee. In particular there was unanimous agreement with the recommendation that the System must be transferred quickly to various users at those Centres requesting it.

14. For its next meeting the Advisory Committee has requested the Taximetrics Laboratory to prepare targets for the next few years, and also to consider how many people should be trained and how many institutions should be assisted. The Advisory Committee will meet again in January 1977 to consider these matters, as well as the organizational arrangements for the Laboratory.

15. In principle, the Executive Committee could see no reason why the Advisory Committee should not act in the future, if requested to do so, as the top-level policy advisory body for the Taximetrics Laboratory.

Coconut Working Party

16. A report of the Coconut Working Party (AGPE:IBPGR/76/10) was presented in a preliminary form pending the final report which will be submitted to the next meeting of the Executive Committee.

17. The Committee expressed sympathy with the desire to strengthen genetic resources in coconuts but suggested that revision of this preliminary report should aim to produce a substantive programme of action including estimated costs, and an analysis of the urgency of the programme, the risk, if any, of erosion in the crop, and how the priority for coconut compares with those for other crops. The Chairman of the Working Party should be informed of these suggestions. The Executive Committee felt that there was undue emphasis in the preliminary report of the Working Party on structural and name changes, and that recommendations were lacking for a proper action programme apart from that dealing with exchange of material.

18. The Chairman of the Working Party should be advised that the members of the Working Party could themselves decide on descriptors, and once these were agreed upon, the Board would be willing to see that advice on documentation systems would be made available from the group at Boulder. Moreover, it was felt that the sampling size of populations would be constrained by the space available for collections for long-term conservation. However, specific proposals which would enable members of the Working Party achieve their objectives would be considered by the Board.

Proposed collection of sorghum in the Sahelian zone

19. The Secretary outlined progress in the discussions between ICRISAT/ORSTOM/IBPGR for the collection of sorghum and millets in 1976. It appears that ORSTOM only carried out part of the mission in 1975 (with financial support from UNEP), because of administrative and other problems which prevented the plant explorers from visiting several countries of the Sahel.

20. A meeting organized by the Secretariat will take place at FAO in June 1976 to finalize the details of the exploration programme and Mr. Harlan, Chairman of the IBPGR Advisory Committee on Sorghum and Millets, will be present. When the final proposal is ready, this will be submitted to Mr. de Bakker for approval. It was agreed that this meeting should also start the detailed planning required for exploration in 1977.

21. The Secretariat was asked to inform Mr. Steele at IITA of the missions in case he would wish an official of the IITA Germplasm Collection Unit to participate.

PROPOSALS RECEIVED

Flora of Turkey and the Aegean Islands (P.H. Davis)

22. This proposal had been previously considered at the second and third Executive Committee meetings, and was reconsidered in the light of its importance for genetic resources work in Southwest Asia. It was agreed, with regret, that the project could not be supported since it was outside the terms of reference of the Board. However, agricultural colleagues in Turkey will be asked whether they consider the project to be of sufficient importance that, a) some funding could be provided nationally, and b) they might wish to seek assistance from an international agency such as UNESCO or UNEP.

Establishment of prototype stands for ex situ conservation/selections of provenances (H. Steinlin, Forest Resources Division, FAO)

23. Following the decisions taken at the third Board meeting, the Executive Committee agreed that it was unable to decide on this proposal until the whole question of forest genetic resources had been put before the CG. Although the Committee could see the importance of the proposal, and would be in favour of it, guidance was necessary from the CG. It was agreed that a letter should be

sent to the CG pointing out that, although a forester was a member of the Board, and although the Board's terms of reference suggest that the Board seek advice from the FAO Panel of Experts on Forest Gene Resources, the Chairman of TAC had indicated opposition to any IBPGR financing in the field of forest genetic resources. The wish of the IBPGR to consider two areas of tree genetic resources, i.e. those important for purposes of fuel and of soil conservation for rural development, needs to be clarified in relation to the CG's mandate.

24. It was agreed that Mr. Steinlin should be informed that the Executive Committee was in favour of the proposal, but pending the decisions from the CG, there was little chance of funding this year.

Collection of groundnut germplasm (W. C. Gregory)

25. Following the support of ICRISAT, this proposal was approved in principle, subject to examination of the final plans. The level of funding will be in agreement with the decisions taken at the third Board meeting.

International Arachis Information Service for Germplasm Resources
(D. E. McCloud, University of Florida)

26. Comments had been received from ICRISAT endorsing support of this project for the next two years. The Secretariat was requested to ascertain whether Mr. Varnell was still available to organize this information service, since his employment was due to terminate at the end of March 1976. If Mr. Varnell could be employed, the Board would commence support to the project for two years starting as soon as possible.

27. In relation to the two proposals on groundnuts (paras 25 and 26) and in the light of comments received from ICRISAT, the Committee did not consider that the Board should establish a Crop Advisory Committee on groundnut germplasm at the present time.

Collection of wild and primitive cereals in W. and N. Syria, NE Iran and W. Iran (J. G. Waines and B. L. Johnson, University of California)

28. This proposal was not supported since seed material could be obtained from the proposed areas of explorations from existing collections, and personnel associated with the national programmes of Southwest Asia have offered to collaborate in the supply of material.

Proposed development of techniques for the long-term conservation of seeds for genetic conservation (E.H. Roberts)

29. Preliminary proposals were discussed in order to ascertain whether this type of work was considered suitable for further consideration by the Board. It was decided that the Board would be prepared to consider a detailed proposal from Mr. Roberts on the understanding that the costs would be shared with other sources of support, e.g. ODM, and that the costs would build up only gradually.

FINANCIAL MATTERS

Review of expenditure in 1976

30. The Secretariat provided a detailed breakdown of actual expenditure up to 30 April 1976 and estimated expenditure through the remainder of the year. The paper was revised in the light of decisions taken earlier and the revised estimate of expenditure in 1976 is shown in Appendix II. It was agreed that these estimates should be included as an appendix to the Programme and Budget Proposals for 1977.

31. The total budget proposed for 1976 had been \$1,208,000. It was estimated that actual expenditure in 1976 would be \$939,215. Total funds available in 1976 were \$1,122,763 (new funds of \$845,000 having been pledged plus a carry forward of \$277,763 from 1975). The carry forward from 1976 was therefore estimated at \$183,548.

Programme and Budget Proposals for 1977

32. A draft of these proposals (AGPE:IBPGR/75/52) was tabled. It was agreed that the accompanying script should be greatly expanded, and that in addition to projections for 1976 mentioned in para 30, expenditures in 1975 should also be included as an annex. The proposed total budget for 1977 is \$1,266,000 but in the event that the \$35,000 item for training at IITA was transferred to the core budget of IITA as recommended, the total budget amount would be reduced to \$1,229,000.

ANY OTHER BUSINESS

33. Tax situation: The Chairman outlined the present need to file returns to the U.S. tax authorities. A return has been made for 1974 and probably will be required for 1975. The whole matter arose from the original need to obtain tax-exempt status in order to receive a contribution from the Rockefeller Foundation pledged in 1974. Since receiving tax-exempt status the Board finds itself with onerous reporting requirements to be filed with the authorities; a waiver of these reporting requirements was sought but refused by the Internal Revenue Service. It is therefore proposed that an attempt be made to obtain a retroactive reversal of the tax-exemption ruling. Towards this end the services of an Italian lawyer have had to be retained. The Committee agreed to the lawyer's fee of \$200.

34. Centres Directors and TAC meetings: Mr. Bommer outlined the general response to the draft Programme and Budget Proposals for 1977 at the meeting of TAC held at IRRI, Philippines, 9-13 May 1976. The Executive Committee agreed that, in future, a Board representative would attend the TAC meeting to represent and clarify the Board's position and take the opportunity of an exchange of views regarding programmes with Centre Directors.

35. Relations with Australia: A request has been made for a delegation of IBPGR to visit Australia to develop a basis for collaboration. Following a formal invitation from the CSIRO Division of Tropical Agronomy, it is tentatively planned that Messrs. Demuth and Bunting will visit Australia in April or May 1977. The Executive Committee was wholly in favour of liaison with Australia due to that country's long history of work in genetic resources and because of the reciprocal benefit that could emerge.

36. Proposed meetings for the South Asia and Southeast Asia regions: Mr. Joshi and the Secretariat reported on preliminary plans for these meetings. The South Asia meeting is likely to be a small one held in Delhi in December, and the Southeast Asian meeting in association with ASEAN will be held in Bangkok or Manila in either October or December.

DATES OF MEETINGS

37. The next meeting of the Executive Committee will be 18-19 November 1976; but the meeting could commence in the afternoon of 17 November if the length of the agenda should so require. The fourth Board meeting had previously been fixed for May 1977. However, it was agreed that a meeting in February would be desirable if acceptable to the other members of the Board. Accordingly, the following dates have been tentatively agreed for 1977:

7th Executive Committee	21 February 1977
8th Executive Committee	May 1977
Fourth Board meeting	22-25 February 1977

APPENDIX I

AGENDA

1. Adoption of the agenda
2. Reports on current activities:
 - 2.1 Report on discussions concerning the Lae collection of bananas (A.H. Bunting)
 - 2.2 European network of genetic resources centres, including Mediterranean programme (Secretariat)
 - 2.3 Southwest Asia regional programme (A.H. Bunting)
 - 2.4 Reports of Crop Advisory Committees (Secretariat). Minutes and recommendations of Rice Advisory Committee (AGPE:IBPGR/76/9)
 - 2.5 Advisory Committee on GR/CIDS project (AGPE:IBPGR/76/7) (A.H. Bunting)
 - 2.6 Coconut Working Party (AGPE:IBPGR/76/10) (Secretariat)
 - 2.7 ICRISAT/ORSTOM proposal for the collection of sorghum in the Sahelian zone (Secretariat)
 - 2.8 Proposals received requiring Committee decision
3. Review of programme and budget for 1976
4. Programme and Budget Proposals for 1977 (AGPE:IBPGR/75/52)
5. Dates of next meetings
6. Any other business

PROPOSED AND ESTIMATED EXPENDITURE FOR 1976

Budget Proposal	Item	Projected estimate of expenditure
352,500 7,500 <u>360,000</u>	1. <u>GR/CIDS</u> 1.1 Contract with the Taximetries Laboratory of the University of Colorado 1.2 Advisory Committee meeting	352,500 10,750 363,250
68,000 100,000 50,000 <u>218,000</u>	2. <u>Support of germplasm activities at genetic resources centres</u> 2.1 Regional Programmes: ¹ (a) Mediterranean: Collection of cereals and legumes in N. Africa (b) SW Asia: Reorganization of the regional programme (c) S Asia: Planning the cooperative regional programme (d) SE Asia: Planning the cooperative regional programme (e) Africa: IITA programme for the collection of grain legumes, roots and tubers in West Africa	45,450 43,000 15,000 10,500 26,500 140,450

¹ The organization of the Mediterranean programme did not proceed as quickly as the Board anticipated. Less funding is required for SW Asia due to SIDA providing further capital equipment against the unspent funds at the date of the termination of SIDA financial support. Regional organization envisaged for the two other Asian regions was not required in 1976 hence the lower expenditures which relate to planning activities.

Budget Proposal	Item	Projected estimate of expenditure
	2.2 Exploration, collection, storage: ¹	
	- Collection of cereals and grasses in N. Pakistan	13,500
	- Collection of primitive varieties of <u>andigena</u> potatoes and wild tuber-bearing <u>Solanum</u> sp. in N.W. Argentina	7,500
	- Collection of cereals in N.W. India	9,000
	- Collection of maize in Latin America (from Crop Advisory Committee)	40,000
	- Collection of sorghum and millets in the Sahelian zone of Africa	65,000
		135,000
250,000		275,450
468,000		
	3. <u>Support of activities related to specific crops</u>	
	- Advisory Committee on rice	13,165
	- Advisory Committee on maize	10,500
	- Advisory Committee on wheat	8,229
	- Advisory Committee on sorghum and millets	11,000
	- Advisory Committee on <u>Phaseolus</u> beans	7,800
	- Coconut Working Group	8,576
	- Position paper on Tropical Fruits	1,300
	- Survey of banana germplasm	3,600
		64,170
60,000		
	4. <u>Quarantine problems</u> ²	
	- Authors' contracts	250
	- Finalization of technical paper	1,000
10,000		1,250

¹ When the 1976 budget was proposed it was envisaged that some Crop Committees would have prepared substantive collection programmes but these will not be forthcoming before 1977

² Contracts were offered late in 1975 and the Task Force Meeting took place in December 1975. Accordingly, the major expenditures (\$15,500) for this item were charged against the 1975 budget and only minor amounts remained to be charged against the 1976 budget. The provision for each of the two years was \$10,000, so there will be an overall

ATTACHMENT II
(continued)

Budget Proposal	Item	Projected estimate of expenditure
25,000	5. <u>Training</u>	
	5.1 University of Birmingham grant	25,000
	5.2 Supplementary grant in 1976 to the ¹ University of Birmingham	28,088
<u>10,000</u>	5.3 Evaluation of present training facilities available	<u>4,000</u>
35,000		57,088
	6. <u>Board meetings and missions</u>	
	6.1 Meetings:	
	- 4th Executive Committee and 3rd Plenary	32,820
	- 5th Executive Committee	9,920
	- 6th Executive Committee	<u>10,000</u>
75,000		52,740
25,000	6.2 Specific assignments undertaken by Chairman and Board members	31,590
<u>15,000</u>	6.3 Publications	<u>7,325</u>
115,000		91,655
	7. <u>Secretariat expenses</u>	
20,000	7.1 Travel by Secretariat and Consultants	20,645
30,000	7.2 Personnel services and consultant on publications	29,526
<u>10,000</u>	7.3 Miscellaneous (including supplies for dry copier)	<u>10,000</u>
60,000		60,171
	8. <u>Contingencies</u>	
	8.1 Working Group on Engineering, Design and Cost Aspects of Seed Storage and Construction	4,730
	8.2 International <u>Arachis</u> Information Service for Germplasm Resources	18,951
	8.3 Fee for professional legal advice	200
	8.4 Consultant to advise on CIAT seed store	<u>2,300</u>
100,000		26,181
1,208,000	TOTAL	939,215

¹ Transferred from Contingency fund to provide facilities for additional students from developing countries

APPENDIX III

LIST OF DOCUMENTS

AGPE:IBPGR/75/52	Programme and Budget Proposals for 1977
76/6	Provisional Agenda
/7	Preliminary draft of first report of the GR/CIDS Advisory Committee
/9	Minutes of the first meeting of the Rice Advisory Committee
/10	Draft Preliminary Report of Working Group on Coconut Genetic Resources

Information papers:

Exchange of correspondence re SW Asia programme: copy of letter from Mr. Bunting to Mr. Karaca dated 2 April 1976 and copies of letters from the UNDP and FAO representatives in Turkey dated 12 and 15 April respectively

Letter dated 1 May 1976 from H. C. Harries, Chairman, Coconut Working Group attached to preliminary report

Proposals -

- (a) Flora of Turkey and the Aegean Islands (P. H. Davis)
- (b) Establishment of prototype stands for ex situ conservation/selections of provenances (H. Steinlin, Forest Resources Division, FAO)
- (c) Collection of groundnut germplasm (W. C. Gregory)
- (d) International Arachis Information Service for Germplasm Resources (D. E. McCloud, University of Florida)
- (e) Collection of wild and primitive cereals in W. and N. Syria, NE Iraq and W. Iran (J. G. Waines and B. L. Johnson, California)
- (f) Proposed development of techniques for the long-term conservation of seeds for genetic conservation (E. H. Roberts)

Proposed and estimated expenditure for 1976

is providing information about the physiology of this crop, about the nutritive value of its seeds and about consumer preferences.

INTERNATIONAL COOPERATION

The success of this venture will depend largely upon close liaison and cooperation between the project headquarters in Ibadan, on one hand, and national ministries, research institutes, and university faculties of agriculture and science on the other. Funding for the project will include an allocation to pay for services provided by such organizations and, in some cases, for subcontracting some of the exploration and collecting work to local scientists. The possibility of financing research students to work on genetic resource conservation in their home countries, especially to study wild relatives of cultivated species, is being investigated. Close contact with Nigerian and other national plant quarantine authorities will be established so that, without jeopardizing their standards, they can help to make conservation a practical success.

Provided that authority to enter and work in a country has been obtained, each expedition will be preceded by a visit from a botanist on the project staff. During this, and perhaps subsequent

visits, the purpose will be to discuss ways in which national bodies are willing and able to assist collecting teams.

Some important ways in which local cooperation and help will be desirable are the provision of:

- A working base, preferably within an agricultural research institute or a university department of crop science or botany.
- Personnel to act as guides and interpreters or to assist with growing the collections locally when this is necessary for plant quarantine inspection and certification;
- Land and labor to grow the collections;
- The most recent physical, vegetation, rainfall and soil maps;
- A vehicle for hire, at least in countries too far away from Nigeria for the collecting teams to use their own;
- Access to local records of agricultural surveys, to existing germplasm collections and their documentation, and to national herbaria;
- The help and advice of local scientists.

CORRESPONDENCE

The project headquarters at Ibadan will welcome criticism of this program and will try to answer questions about it. Correspondence should be addressed to:

GERMPLASM COLLECTION UNIT
IITA
P.M.B. 5320
Ibadan, Nigeria.

GERMPLASM COLLECTION

CONSERVING THE ESSENTIAL AND
IRREPLACEABLE RAW MATERIALS
OF PRESENT AND FUTURE
PLANT BREEDING



The IBPGR/IITA Project for
Conserving Genetic Resources of
African Food Legumes, Roots, Tubers and Rice.





IPP Newsletter

International Peanut Program

302 Newell Hall University of Florida Gainesville, Florida 32611 Telephone: 904/392-1811

No. 1, July 1976

IPP NEWSLETTER INITIATED

With this inaugural issue, the International Peanut Program (IPP) begins publication of the IPP Newsletter. The purpose of the Newsletter is to disseminate information regarding Arachis genetic resources and related information. Distribution is international. The first few issues will be published as needed, but publication is expected to eventually consist of three or four issues per year on a regular schedule.

The Newsletter will emphasize the conservation, documentation, and utilization of Arachis genetic resources around the world. Collecting trips, specimens collected, new cultivars, new equipment, and characteristics of specific accessions will be described. Items regarding personnel working with peanut germplasm will be included. Activities in IPP and in other agencies dealing with Arachis genetic resources will be mentioned. Meetings of interest will be announced, and their results and recommendations will be reported.

In addition, readers of the Newsletter are encouraged to suggest items for publication. Information on new cultivars, procedures, equipment, diseases, and pests; the spread and intensity of infestations; and new or unusual traits in peanut stocks is especially solicited. Other items may be suggested, and comments will be appreciated.

THE INTERNATIONAL PEANUT PROGRAM IS ESTABLISHED

The International Peanut Program is a broadly based concept for conducting peanut research on an international scale. The program has been established within the last two years at the University of Florida, Gainesville, Florida, USA, with Dr. Darell E. McCloud, professor of Agronomy, as project coordinator. The program was established and continues to be supported by grants from THE ROCKEFELLER FOUNDATION. The first letters of the words in the program name form the abbreviation IPP which can be used in referring to the program.

The main purpose of IPP is to increase peanut yields, making this crop more competitive with the cereals. Work has already begun on a systematic International Peanut Evaluation Test (IPET) in collaboration with peanut scientists in Venezuela, Brazil, Argentina, South Africa, Rhodesia, Thailand, Israel, Costa Rica, Egypt, Mexico and India. We would welcome additional participants. The objective of this project is to produce varieties featuring high yields, wide climatic and soil adaptation, and broad disease and pest resistance while maintaining genetic diversity. Other ongoing projects include physiological research to improve yields, improvement of the nutritional quality of the peanut, and development of a genetic resources center.

IPP, an international program at the University of Florida's Institute of Food and Agricultural Sciences, in cooperation with state, national, and international organizations, is devoted to improving yields and quality as an important source of vegetable protein and oil.

IPP TO ESTABLISH AN INFORMATION SERVICE FOR PEANUT GERmplasm RESOURCES

The establishment of an information service for peanut germplasm resources by IPP has been assured with a grant from the INTERNATIONAL BOARD FOR PLANT GENETIC RESOURCES. The service will be established over the next 18 months at the University of Florida, Gainesville, Florida, USA, and will be named, "International Arachis Information Service for Germplasm Resources." Establishment of the Service will be the responsibility of Dr. R. J. Varnell, Assistant Research Scientist, under the direction of IPP Project Coordinator, Dr. D. E. McCloud.

The purpose of the information Service is to process and disseminate Arachis germplasm documentation and related information. The Service will be operated in cooperation with the IFAS Statistical Consulting Unit at the University of Florida and the Genetic Resources/Communications, Information, Documentations Systems group, headed by Dr. David Rogers, University of Colorado, Boulder.

IPP HOLDS WORKSHOP ON PEANUT GERmplasm PRESERVATION

An international workshop on "Germplasm Preservation and Genotype Evaluation in Arachis (Peanuts)" was held at the University of Florida, Gainesville, USA, July 11-15, 1975. The workshop was attended by 26 scientists, including specialists in peanuts, plant quarantine and introduction, germplasm documentation, and germplasm maintenance, representing 15 countries in North and South America, Africa, Europe, and Asia. The workshop was held under the auspices of IPP and was jointly sponsored by THE INTERNATIONAL BOARD FOR PLANT GENETIC RESOURCES, THE ROCKEFELLER FOUNDATION, and the UNIVERSITY OF FLORIDA. This workshop is regarded as the first step towards the international organization and preservation of the world resources of Arachis germplasm.

The recommendations unanimously approved by the participants included, among other things, the establishment of international germplasm centers in India, the United States and central South America and an international computerized information center. It was also recommended that IPP should continue to coordinate activities pertaining to Arachis germplasm resources, at least until a center is established and capable of assuming this responsibility. All of the recommendations are contained in a 20 page report, edited by R. J. Varnell and D. E. McCloud, published in October, 1975.

In addition to the recommendations, the report outlines the need to organize peanut germplasm resources internationally and the progress in interspecific hybridization of Arachis since 1951. Copies of the report can be requested from IPP.

7/22

Dave,

Also, Lencic
Bryant is on our
Colorado Native Plant
Society steering
comm. He strikes
me as being a sharp
botanist and fine
person.

John

7/22

John:

Are you familiar with Bob Adams,
who runs this thing called "RAPIC"?

See p. 2 of the newsletter for an
item of interest-

Bob uses our system, TAXIR,
to do this work-

Please let me have this back-

Dave R.

Dave,
yes, I know him &
have attended his
workshop illustrating the
RAPIC. Looks great to me.
Glad to know TAXIR

Rapid Access Plant Information Center
Department of Botany and Plant Pathology
Colorado State University
Fort Collins, Colorado 80523

R A P I C N E W S L E T T E R

No. 2

February, 1976

COUNTY RECORDS

Michael Verik of Pomona High School in Arvada was the first high school student to receive a certificate for a new county record. Verik, a student of Christine Curry Jones, collected in Jefferson County.

A group from CSU went to Weld County for a half day's collecting trip last July. Although not searching for new records, they found when they returned that eleven of the thirty-five plants collected had never been collected in Weld County! Recently, Dames & Moore's researchers sent in specimens which more than quadrupled the Morgan County records. So there are plenty of county records still to be made.

If you have specimens between newsprint ready to be sent in, we urge you to do so as soon as possible. Be sure to include all of the information on location, site description, date, collector, etc. Some specimens have had to be rejected because of insufficient accompanying data.

County records were updated last July. Some appreciable increases in species number were made for many counties.

KEYWORD COUNTIES

A change in the RAPIC program now allows all of the counties in which a species has been collected to be listed. Formerly only species lists for a given county were available. Because so many users asked if RAPIC could give them a list of all of the counties in which a given species had been collected, we added this feature. We think you will find it a very useful addition.

NEW ATTRIBUTES LIST

A new attributes list is enclosed. Some new descriptors with data are THREATENED and ENDEMIC and individual listings of the vegetation types. Data is now in for the descriptors ENDANGERED and CARBON DIOXIDE FIXATION. The former descriptor, DOMESTIC FORAGE VALUE has been changed to CATTLE FORAGE VALUE and SHEEP FORAGE VALUE.

VEGETATION ZONES

The descriptor VEGETATION TYPE lists any species in a vegetation type if 80% of the range of that species occurs in one vegetation type. Many users were interested in knowing whether a species was present at all in a given vegetation type. The new separate listings of vegetation zones gives this information. Not only can a list of the species present in a vegetation zone such as SUBALPINE be listed but through a new statement, KEYWORD VEGETATION ZONES, all of the vegetation zones can be listed in which a given species occurs.

ENDANGERED and THREATENED

The impetus given endangered and threatened species by the publication of the Smithsonian list has caused renewed interest in this difficult area. Almost everyone has a different idea about what should be considered rare, endangered or threatened. RAPIC's categories have been defined as follow:

ENDANGERED, Colorado: A species which is in imminent danger of extinction from the state of Colorado. It may not be endangered elsewhere.

ENDANGERED, North America: A species which is in imminent danger of extinction from the continental United States.

ENDANGERED, World: A species which is in imminent danger of extinction throughout its entire range. This would include, of course, all Colorado endemics which are endangered.

THREATENED, Colorado: A species which is likely to become endangered within the foreseeable future in the state of Colorado.

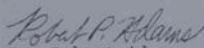
THREATENED, North America: A species which is likely to become endangered within the foreseeable future in the continental United States.

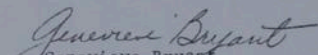
THREATENED, World: A species which is likely to become endangered within the foreseeable future throughout its entire range.

If you would like to review this lists and give comments, please write for copies.

QUERY CHARGES

Almost as certain as death and taxes are tightening budgets. RAPIC's budget is no exception. On July 1, 1976, RAPIC will begin charging for queries to non-participating commercial, governmental and private agencies. Participating users are those who are cooperating by sending information (or new vouchers) to RAPIC. No charge will be made for educational users except where large and/or multiple queries are requested. The costs will vary according to the computer time charges, with a minimum charge of \$5.00 per query.


Dr. Robert Adams
Director, RAPIC


Genevieve Bryant
Assistant Director, RAPIC

Plant Attributes Used by RAPIC

Descriptors are in capitals and descriptor states are in parentheses.

NAMES

DIVISION (conifer, dicot, monocot, fern allies)
 FAMILY (133 family names)
 GENUS (785 generic names)
 SPECIES (1947 specific names)
 INFRASPECIFIC (722 infraspecific names)
 COMMON NAMES (1911 common names)

LOCATIONAL

63 counties* Example: BACA COUNTY (present, unknown)
 MAXIMUM ELEVATION (from 3000 to 15000 in 100 feet)
 MINIMUM ELEVATION (from 3000 to 15000 in 100 feet)
 VOUCHERED (distribution map number)
 RELIABLE (distribution map number)
 UNCONFIRMED (distribution map number)
 ORIGIN (Asia, Colorado, Eurasia, Europe, North America, Other, South America)

ECOLOGICAL

HABITAT (aquatic, emergent, wet, mesic, dry, epiphytic, halophytic, phreatophytic)
 VEGETATION TYPE [note--80% of the range of the species must occur in a vegetation type, left blank if less than 80% correlation] (alpine, disturbed area, greasewood, montane, mountain-grassland, oak-brush, pinyon-juniper, plains-grassland, riparian woodland, sagebrush, sandsage, shadscale, subalpine, willow carr)
 ALPINE (present, unknown)
 DISTURBED AREA (present, unknown)
 GREASEWOOD (present, unknown)
 MONTANE (present, unknown)
 MOUNTAIN-GRASSLAND (present, unknown)
 OAK-BRUSH (present, unknown)
 PINYON-JUNIPER (present, unknown)
 PLAINS-GRASSLAND (present, unknown)
 RIPARIAN WOODLAND (present, unknown)
 SAGEBRUSH (present, unknown)
 SANDSAGE (present, unknown)
 SHADSCALE (present, unknown)
 SUBALPINE (present, unknown)
 WILLOW CARR (present, unknown)
 ABUNDANCE (abundant, common, rare, uncommon)
 ENDANGERED (Colorado, North America, World)
 THREATENED (Colorado, North America, World)
 + VEGETATION DOMINANT (yes, no)
 ENDEMIC (yes, maybe, no)
 + RANGE TREND INDICATOR (upward, downward, stable, none)
 DISTURBANCE INDICATOR (erosion, farming, overgrazing, traffic, other, no)
 EDAPHIC INDICATOR (gypsum, selenium, serpentine, very acidic, very alkaline, other)

*The county names are not included due to space limitation.

*There are no data for these descriptors yet.

LIFE HISTORY

- LIFE CYCLE (perennial, biennial, annual)
TROPIC STATUS (parasitic, symbiotic, saprophytic, autotrophic)
REPRODUCTION (sexual, vegetative, apomictic, vegetative-sexual)
ANTHESIS (January, February, March, April, May, June, July, August, September, October, November, December)
DISPERSAL AGENT (wind, water, gravity, birds, mammals, other, none)
HABIT (tree, shrub-tree, shrub, sub-shrub, vine, grasslike, forb)
+ CARBON DIOXIDE FIXATION (C3, C4, none, other, crassulaceous)

ECONOMIC ATTRIBUTES

- CATTLE FORAGE VALUE (good, fair, poor, none)
SHEEP FORAGE VALUE (good, fair, poor, none)
GAME FORAGE VALUE (good, fair, poor, none)
+ EROSION CONTROL (good, fair, poor)
+ GAME COVER VALUE (good, fair, poor, none)
REVEGETATION USE (good, fair, poor, none)
AESTHETIC VALUE (good, fair, poor, none)
WEEDINESS (noxious, economic, economic-noxious, non-weedy, colonizing)
ALLERGENIC (yes, no, maybe)
EDIBLE (yes, no, maybe)
POISONOUS (acute, cumulative, no)

POISONOUS SYMPTOMS IN LIVESTOCK

- ABDOMINAL PAIN (yes, unknown)
AMUROTIC CONDITION (yes, unknown)
BAWLING (yes, unknown)
BELCHING (yes, unknown)
BIGHEAD (yes, unknown)
BITING-AND-CHEWING (yes, unknown)
BLINDNESS (yes, unknown)
BLOATING (yes, unknown)
BLOOD BRIGHT (yes, unknown)
BLOOD DARK (yes, unknown)
BREATH-ALMOND ODOR (yes, unknown)
BREATHING LABORED (yes, unknown)
BREATHING RAPID (yes, unknown)
COLLAPSE (yes, unknown)
CONVULSION (yes, unknown)
CONSTIPATION (yes, unknown)
DEMENTED ACTION (yes, unknown)
DEPRESSION (yes, unknown)
DIARRHEA (yes, unknown)
EDEMA (yes, unknown)
FEVER (yes, unknown)
FECES SPARSE (yes, unknown)
GAIT STIFF (yes, unknown)
GASTROENTERITIS (yes, unknown)
HEARTBEAT DEPRESSED (yes, unknown)
HEARTBEAT-IRREGULAR (yes, unknown)
HEMOGLOBINURIA (yes, unknown)
HEMOLYTIC ANEMIA (yes, unknown)
HUSKY VOICE (yes, unknown)
MOUTH IRRITATION (yes, unknown)
MUSCULAR TWITCHES (yes, unknown)
MUSCLE WEAKNESS (yes, unknown)
NAUSEA (yes, unknown)
NEPHRITIS (yes, unknown)
NOSTRILS BLEEDING (yes, unknown)
OPISTHOTONUS (yes, unknown)
ORAL TISSUES RED (yes, unknown)
PARALYSIS (yes, unknown)
PHOTOSENSITIZATION (yes, unknown)
PROSTRATION (yes, unknown)
PUPIL DILAT/CONT (yes, unknown)
RESPIRATORY PARALYSIS (yes, unknown)
RESTLESSNESS (yes, unknown)
SALIVATION (yes, unknown)
SALIVATION FROTHY (yes, unknown)
SCOURING (yes, unknown)
SEVERE PAINS (yes, unknown)
SKIN SENSITIVE (yes, unknown)
STAGGERING (yes, unknown)
STANCE STRADDLED (yes, unknown)
TONGUE PARALYZED (yes, unknown)
UNABLE-TO-EAT (yes, unknown)
UNEASINESS (yes, unknown)
URINE BLOODY (yes, unknown)
URINE DARK COLORED (yes, unknown)
WEAK PULSE (yes, unknown)

+ There are no data for these descriptors yet.

UNIVERSITY OF MARYLAND
COLLEGE PARK 20742

JUL 22 1976

DIVISION OF AGRICULTURAL AND LIFE SCIENCES
DEPARTMENT OF MICROBIOLOGY
AREA CODE (301) 454-~~2618~~5376

15 July 1976

Dr. David J. Rogers, Director
Taximetrics Laboratory
1229 University Avenue
University of Colorado
Boulder, Colorado 80309

Dear Dave:

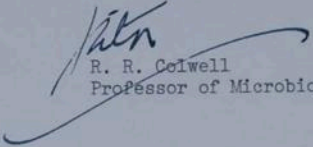
It was a pleasure to have the opportunity to renew acquaintanceship and to visit your laboratory in Boulder. I want to thank you especially for arranging the cocktail party and for hosting the speakers of the symposium and paper sessions of the CODATA Conference. I know that all of us enjoyed it very much and your thoughtfulness was indeed appreciated.

Please keep me on your mailing list for reprints. Copies of your most recent reprints would certainly be welcome.

Please convey my regards to the members of your staff. I certainly enjoyed meeting them.

With all good wishes,

Yours sincerely


R. R. Colwell
Professor of Microbiology

RRC/ezg

UNIVERSITY OF COLORADO
MEDICAL CENTER
4200 EAST NINTH AVENUE
DENVER, COLORADO 80220

SCHOOL OF MEDICINE
DEPARTMENT OF PREVENTIVE MEDICINE
AND COMPREHENSIVE HEALTH CARE

MEMORANDUM

TO: R. Curtis Johnson
Dean of International Education
Office of International Education
University of Colorado
Boulder, Colorado 80302

FROM: Robert A. Aldrich, M.D. *Robert A. Aldrich*

SUBJECT: Brazil and Professor Chagas

DATE: July 8, 1976

JUL 21 1976

RECEIVED
JUL 13 1976
INTERNATIONAL EDUCATION
UNIVERSITY OF COLORADO

I am enclosing a copy of a letter I received from Professor Carlos Chagas, my host when I visited Brazil about a year and a half ago, and a friend of some eight or nine years. In the last few weeks I had occasion to communicate with him further since I knew that Executive Vice-President J. Russell Nelson would be visiting in Brazil. My most recent letter from Professor Chagas indicates that his health has been restored and I think it would be appropriate to explore opportunities for him to visit the University of Colorado in the coming academic year.

In a brief telephone conversation with Russ Nelson I was delighted to learn that his impressions of the situation in Brazil are nearly exactly the same as my own and that he shares a great concern that this University take an active role in helping where we can in the further development of Brazil.

I am preparing a letter to Professor Chagas which will inquire about his plans for travel in the next academic year in order that we might plan for a visit of a few days at the University of Colorado. Russ Nelson indicated that he was hoping to get several interested people together again to go over his own experiences and it might be appropriate then to further explore our interest in having Professor Chagas come here.

RAA:ds

Enclosure

CC: J. Russell Nelson
Executive Vice-President
University of Colorado, Boulder

Dr. Christopher Paterson
International Division
University of Colorado Medical Center, Denver

31 March 1976

Prof. Robert A. Aldrich
Dept. of Preventive Medicine and
Pediatrics
The University of Colorado Medical Center
4200 East Ninth Ave.
Denver, Colorado 80220
U. S. A.

Dear Doctor Aldrich,

This is to thank you very much for your kind letter. The work here regarding handicapped children is far from being what I would like it to be, however, I believe that some progress is being made; but the fact is that we are extremely short in manpower and also, in many instances, in the understanding of the problem. Certainly there is a lot of devoted people but they are not considering the problem under its real light, they are not scientifically minded and they are unfamiliar with some aspects of the problem.

I have not been very active in the field of handicapped children because one year ago I had to put a pace-maker - which is working extremely well and has given me a new dynamism, but has made it impossible for me to envisage a great number of things outside my direct fields of interest, - and indeed this fact of my operation and recovery took me more or less six months out of my routine duties and work, so that just now I am resuming the whole of my activities.

Recently I have been to Boston and during the meeting of the AAMS I saw an exhibit of some technological improvement gadgets they use for handicapped ones. I was really marvelled by what I saw, and it is still my belief that much more can be done in this direction.

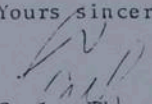
I am extremely honoured by your invitation to visit your University and naturally would gladly accept it if I review what I could talk about and which could be my contribution to your

group. Anyway if you can find use for myself with great pleasure I will include Denver in my next trip to the USA.

I must say that my stay in Boston was a very short one, as a matter of fact I spent only seven days outside from Brazil, but it was enough to see a bit of your economic recovery and the impetus of your intellectual life, and, also, to increase my admiration for your country.

With my best regards to your wife and yourself, I am

Yours sincerely,



Carlos Chagas

UNIVERSITY OF COLORADO
MEDICAL CENTER
4200 EAST NINTH AVENUE
DENVER, COLORADO 80220

SCHOOL OF MEDICINE
DEPARTMENT OF PREVENTIVE MEDICINE
AND COMPREHENSIVE HEALTH CARE

July 9, 1976

Professor Carlos Chagas
Universidade Federal Do Rio De Janeiro
Ilha Universitaria
Rio De Janeiro - RJ
Gabinete Do Decano

Dear Carlos:

I write to you a day or so after the return of my very dear colleague, Professor Russell Nelson. He visited mainly in the northeastern part of Brazil and was in Rio for a brief period. Upon his return, he has told me that the impressions Brazil made upon him were almost exactly the same as my own. We are convening our group of faculty who have been to Brazil in the next two weeks and I believe that a serious effort is underway to develop a working relationship with interested Universities in Brazil for purposes of research, education, and training.

May I thank you most sincerely for your response to my cable and express my regret that you and Professor Nelson were unable to become acquainted at that time. Nevertheless, we very much want to have you visit the University of Colorado upon one of your travels to the United States. Perhaps you could write to me this summer and give me an idea of when you might be traveling again to the United States so that we could extend an official invitation to have you join us for a few days and discuss ways and means that we might participate with you in programs of research, education, and training.

Marjorie joins me in sending our very best wishes to you and your family. We both think frequently of our delightful stay and the interesting and friendly people whom we met while in Rio.

With kindest personal regards.

Sincerely yours,

Robert A. Aldrich, M.D.
Professor of Preventive Medicine
and Pediatrics

RAA:ds

CC: J. Russell Nelson, Executive Vice-President
University of Colorado, Boulder

R. Curtis Johnson, Dean of International Education
University of Colorado, Boulder

THE UNIVERSITY OF COLORADO IS AN EQUAL OPPORTUNITY EMPLOYER

RALPH HOLT CHENEY
11 PARK STREET
WOODS HOLE, MASS. 02543

JUL 6 1976

June 28, 1976

Dr. David J. Rogers
Dep't. of Environmental Populations and Organismic Biology
University of Colorado, Boulder, Colorado 80309

Dear Dr. Rogers:

Upon my return this Spring from a month on the Hawaiian Islands of Oahu, Kauai, Hawaii, and Maui, I began to catch up with my journal reading. In the January-March issue of Economic Botany, vol. 30, no. 1:3-5, I enjoyed very much your excellent and sensitive appreciation of Edmund Henry Fulling with the fine photograph of him in this volume dedicated to him. I would be very grateful if I might have a reprint of your article for my files because I knew Ed Fulling quite well years ago. I was associated with him as a member of his Editorial Board for the first decade of the journal and I was the author of the article on "The Biology and Economics of the Beverage Industry" in Econ. Bot., vol. 1, pg. 243-275 (1947); and later the senior author with Elizabeth Scholtz on "Rooibos Tea, A South African Contribution to World Beverages" in Econ. Bot. 17, no. 3:186-194 (1963).

I admired Edmund Fulling very much for his great service to Botany through his devotion and support and the quality standards he maintained for the Botanical Review and Economic Botany which he founded. I have always been happy about the little rôle I had in stimulating Ed to start the venture of Econ. Bot. in 1947 and he was generous enough to mention it a couple of times during the years. As I recall, it was in March 1945 when Ed was an officer in the Torrey Botanical Club when I gave a paper on "The Pineapple Industry". For some unknown reason, in my introductory remarks before presenting my prepared talk, I stated that it seemed strange that we had a journal of Economic Geology and applied technical journals in various sciences but NOT in Economic Botany, an applied field upon which the human race has always been dependent. After the lecture, Ed Fulling came up to me and said, "Why Not?". We sat down and talked about the possibility. He said that if I would aid him in contacting possible and capable authors who would submit articles so he would be assured of enough good papers for one year, he would undertake to launch Economic Botany.

As it happened, I had established pleasant associations with a considerable number of men who were involved with experimental Stations or with Companies in semi-tropical and tropical, crop-producing areas where coffee, tea, and cacao were cultivated. I had made these connections while writing the "Scientific Monograph on the Economic Species of the Genus COFFEA L." which had been published years earlier by the N.Y.U. Press. Moreover, I had maintained my interest in beverage and medicinal plants ever since I had the course in Economic Botany at Harvard. My research on the effects of their chemical constituents upon animal tissues began to require more of my attention because I had the non-clinical years in medical school before the first world war and I began my studies in cellular pharmacology, using almost exclusively the drugs derived from plant species. This diversity of interest and associations enabled me to supply Ed Fulling with a list of scientists (about 75 as I recall) in various parts of the world who might be interested in contributing papers. Then he spent a couple of years screening possible authors in the U.S. Finally in 1947, as you are aware, he had the courage, the energy, the means, and the ability to launch Economic Botany. As its Founder, it is a Memorial to his appreciation of the significance and need for a journal of this nature in the botanical sciences.

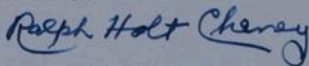
reprint mailed Dec 28, 1976
Digitized by the Hunt Institute for Botanical Documentation

RALPH HOLT CHENEY
11 PARK STREET
WOODS HOLE, MASS. 02543

You, Dr. Rogers, have written such a fine interpretation of the man and his services to Botany that I hope that I may have a reprint sent to me. Edmund Fulling was a delightful and generous individual and he made a great success of both the Botanical Review and of Economic Botany. He accomplished it modestly and primarily by his own efforts originally and was fortunate to have the assistance of yourself and others during the last twenty-five years.

I did not have contact with him in recent years but I will always be grateful for the privilege of my association with him during the 1940's and 50's. I have written at length to explain why I will appreciate having a reprint of your article regarding Edmund Henry Fulling.

Sincerely,



Ralph Holt Cheney

11 Park Street,

Woods Hole, Mass. 02543

TO: Faculty of EPOB

Report of Curriculum Synthesis Subcommittee of the Executive Committee

Dave Rogers *Spring 1976* *Curra. Comm.*
use your own list of courses
Dart, Fuller, Teller
(Rogers, Segal, ~~Winston~~, Winston) as redone for discussions in Spring 1976

This is still a preliminary report with the proposed program with changes and substitutions, the new courses, and those we recommend to be dropped. We did not do any pruning ourselves and the only courses dropped were those which we were told to drop by those teaching them, or courses which would be incorporated into something else. According to our charge, we took all suggestions from the various disciplinary groups and ^{or} incorporated them into the curriculum. We feel strongly that the various disciplinary groups should be evaluating their undergraduate offering continually and not leave ^{it} as a one-shot effort. Much could be done here.

In the list of proposed courses we have done some juggling - partly for P.R. purposes, especially in terms of what substitutes for what. First, please don't begin by berating us - it will do no good. Second, try to look at the overall picture and try to see how things fit or don't fit into a picture. All of this is open for discussion and change, and we hope the criticism will be constructive.

The big thing still to come is working out some logical "streams" as guides for students and advisors. If you have any suggestions give them to Paul Winston.

The committee has tried to do some revising and some reorganization on the Dept. Curriculum without making really drastic changes. We have all felt under the gun for a long time to have more of a plan and we are going to have to make some decisions soon to get us out from under, at least partially. Also, we are not going to get enough space and faculty to do it all and we must decide where to cut and prune. In the main no sweeping changes are suggested

but we are going to point out places where we feel that the Dept. must do some heavy thinking about what we can and can't afford to do.

First, the major changes will be explained and then we will present other aspects which must be discussed and decided on by the Dept. These are points that have come up from all over and then have been hashed over by the Committee, sometimes ad nauseum. In the suggested new courses we have not worked out all the details and ask that you not get sidetracked by small points. Let's look at the forest and hold the trees until later. We are going to need agreement (or not) on the broad philosophy of these changes first.

The first big change, which is all ready in the making, is the substitution of EPOB 202 for 102 for those majoring in the Dept. Up to this point, the plan requires a team-taught survey of animals, plants, and microbes at 5 hours. There are several goals for this: (1) to get the students familiar with the major groups of organisms, (2) to give them a feel for the morphological bases of our understanding Evolution, and (3) to give them an introduction to the bases for Systematics. Majors would take 101 and 110 and then go into 202. Those who "pass" out of 101 would still take 202. You are all familiar with the changes taking place in this curriculum and it need not be belabored here.

There is such a strong feeling in the Dept. that the students need to be exposed to a strong dose of these subjects that this seemed to be the only solution. It is a compromise in that everyone feels that his or her own area surely needs a full semester (or 2) for a full and adequate treatment. It is our feeling that some of this is better than none and that the Principles involved are basically the same no matter what groups are being considered; that it is better given to majors alone rather than to be mixed groups of 102; that more detailed, intensive treatment should be reserved for advanced courses after the kids have had more background in Biology, which would point up to them the needs for this knowledge; and that we cannot require all majors to spend more time on specific areas than this. The advanced courses should then be available for those who need and want them.

Several objections have arisen to cutting out the Physiology, etc. for those not taking 102. However, it is felt that the students are better off with the morphology and survey as a basis for these courses; they don't need a short introduction to physiology as much as the morphology

THE CORE REQUIREMENTS

The required core for Majors would be much like the present one: General Biology--101 and 202, Principles of Ecology--341, Essentials of Physiology--322, and Introductory Genetics--383. With the change to 202, the students would be introduced to five major fields of Biology, on which the advanced courses can build. See below for the changes in 341 and 322.

We must also decide on the requirements for Math and Physical Sciences. Perhaps some compromises are possible on these. One suggestion has been a year of Chemistry plus a year of one other Physical Science. Thus, some Ecologists and Morphologists would benefit more from Geology instead of Physics. The Mathematics requirements are another problem, but one year of Math is probably a bare limit.

We would also suggest that a course in Biomathematics at the 200 or 300 level should be required of all Majors. This would include statistics, modelling, data management, and experimental design.

Ecology and Populations Biology

The Ecologists and many other interested people got together in the early Spring (1975) to try to work out some application of the plan that Carl Bock and others presented for the undergraduate instruction in this field. As four non-ecologists (almost) your committee suggests that there could be more agreement as to what should be done, but we have accepted the compromise that came out of that meeting. It seems very good but is far from ideal and we would like to suggest that more time be spent profitably by those who are or will be teaching undergraduate/techniques for teaching the under-trying to work out the best pattern and graduates. For something so important, precious little time has been given to discussion by the group as a whole and we feel that this is necessary. It should not be "wasted time." We are far too large for each person to do just what he wants to do at the

undergraduate level. The same suggestions are pointed to all of us, not just the Ecologists. We all need to work on the curriculum.

Physiology

The proposed changes are less radical than the Ecologists' but there are some. First, the core course would be "Essentials of Physiology." This will be part plant, part animal, and part microbial. This is a large order, of course, but we feel that it can be done effectively. Plant and animal areas will be separated and taught by different people. They are so different that they come together only at the cellular level and this is where the students will get one dose of cell physiology. The cellular aspects will be worked in when they are needed rather than devoting a special section to the subject. An additional lot of cell physiology will come in with the microbial portion, especially certain biochemical aspects. There is still much to be done on this one.

In this way students can be given a broad slug of Physiology which is not limited to "Plant" or "Animal" or "Cell" in their first course. It is the kind of broad approach needed by those for whom it will be the only ^PPhysiology course. We feel that it would be the best exposure to the subject for the ecologists who need a broader picture of the field than we are giving them now. The Principles and concepts of Physiology, and especially the attitudes of the physiologist can be presented in this way as well as in the more specialized framework we use now.

With this change we would have a separate course in Human Physiology (the name might have to be changed to keep down the numbers of premeds and such). This would be a service course primarily but one still open to selected majors to substitute for the core course, such as prospective High School teachers.

The Physiology group has attempted to set things up to increase the offerings at the 400-level but in smaller, more restricted classes than are possible now. Cell Physiology would be dropped as such with the idea that the necessary cellular concepts will be introduced into the organismic Physiology courses as the need for such treatment arises. It will have the added attraction of removing one glaring point that someone

reviewing the Program might grasp and belabor, to the detriment of other, more important things. We can give our students what they need without having a course labelled with one of the titles of our sister Dept. There is a feeling developing that something like the Ecologists new system might be developed here.

We are suggesting two new courses to contribute to the training of majors for jobs. One would be Techniques in Physiology and Anatomy and would be designed to give the background for working in a research lab. It would include for example, an introduction to Microtechnique. Many students want to go out to work in research labs and such; a basic course like this could cut down considerably on their on-th-job training and thus enhance their chances of getting the job in the first place. A second new course would be call Environmental Physiology and would be designed to help those going into areas where the physiological and medical effects of pollutants, drugs, additives, and such have to be evaluated. The people who have been and will be hired by Industry, EPA, and other agencies are not all going to have Ph.D.'s, (the two men working for the EPA out of Denver on this sort of thing have only B.A.'s) and we can help by giving our undergraduates and M.A.'s some practical background.

Genetics

The elementary Genetics course would be essentially unchanged from the present one.

Microbiology Curriculum

The proposed microbiology curriculum is designed to broaden and integrate course offerings in this area of biological science in such a way as to reinforce the various other disciplines in the Department of EPO Biology. The following proposals are intended to accomplish this goal.

Procaryotic and Eucaryotic Microbiology

1. Expansion of the scope of microbiology by inclusion of all of the unicellular, microscopic organisms, i.e. both procaryotic and eucaryotic microorganisms, Following an introductory survey in the 202 course, it is proposed that the study of these two main groups be divided into a 2-semester sequence. The justification

for this proposal is that a common methodology and ecology underlies both groups. Furthermore in recent years there is growing acceptance of the proposal to unite them in a third kingdom, the Protista. The first semester, involving the study of procaryotic microorganisms, would include the following orders: (a) the blue-green "algae," recently given the name Cyanobacteria; (b) the bacteria; (c) the rickettsia, the mycoplasma and the chlamydia, the smallest and simplest of living cells; (d) and the non-cellular viruses, the simplest of biological entities. The second semester would include the study of eucaryotic microorganisms: algae, protozoa and fungi. The present course offerings dealing separately with each of these special taxa would continue to be taught at an advanced level.

Aquatic and Soil Microbiology

2. Integration of microbiology with our expanded ecological program by including in the latter the sub-disciplines of aquatic and soil microbiology. Microbiology has an as yet unfulfilled contribution to make in the development of ecological science.

Infectious Diseases of man, other animals, and plants

3. Integration of the study of infectious diseases so as to include microbial diseases of plants, animals and man. The central theme of this proposed course would be a study of the host-parasite relationship as a unifying concept, with equal emphasis being placed on the diverse manifestations of this phenomenon. As in the case of the other proposals in microbiology, this course would have to be team-taught. The present courses in Pathogenic Microbiology and Parasitology could be continued at an advanced level. However consideration should be given to the possibility of offering them as separate course sections of a broad course in infectious diseases.
4. Continuation of courses in Microbial Physiology and Immunobiology both to satisfy the needs of majors in microbiology and of majors in related biological disciplines.
5. Expansion of the offerings of advanced seminars in specialized aspects of the

field of microbiology.

Quantitative Biology

It has long been obvious that the Dept. needs more mathematical and statistical material for the students (and faculty?). Several new courses have been proposed and we would like to suggest that a required course be set up at the 200 or 300 level comparable to Quantitative Methods in Biology. This could include Statistics, Research Design, Data Storage, and Data Manipulation.

List of courses to go in Res

Notes:

1. EPOB 202 will be a team-taught survey of plants (higher & lower) and animals (invertebrates and vertebrates). 101 will include Genetics, Cell Biology, and *Evolution*, while 102 will include Ecology, *Survey, Behavior*, Physiology and Development. Because of financial exigencies, the labs have been dropped in 102.
2. Principles of Environmental Biology. A 4-hour course in Principles of Environmental Biology (2 hours of lecture, recitation, and a 3-hour lab). This is to be team-taught with lectures under 200 and labs at 20. The object here would be to present most of the basic principles to the students and "get it out of the way." At this time there is strong criticism that there is too much repetition of these principles from one course to another. Everyone knows that students need repetition, but ecological principles are deceptive in their complexity and it takes a long time for anyone to realize this. A large number of small advanced courses has been proposed to get around this problem. These are divided into two groups--Advanced Environmental Biology I which would include the basic subjects and Advanced E.B. II to include the more Applied and technique-oriented areas. These would have a maximum of 20 students, one section, and would allow for real interchange between faculty and students. There would be 1 lecture and 2 labs, illustrating the philosophy that, after the students have been given the Principles, they most need to get into the lab and field and do something. There is agreement among many faculty members that they would be most willing to spend more contact hours this way than in courses with 60-100 students where there is still inadequate contact with the students. There would be no

TA's for these small classes but adequate (?) permanent staff to take care of lab preps and the organizational details for field trips. There would be 8 of these courses taught each semester with a listing in the Schedule of the title and instructor. At present, the following have been suggested for these courses with a surplus from which 8 would be picked. This arrangement will make it flexible; faculty will not be locked into one subject but will be able to have some variety in the field.

In addition, ~~P~~lant Ecology and Limnology will be taught separately with 60 students and 3 lab sections in each.

Advanced Environmental Biology I

- Forest Ecology
- Grassland Ecology
- Tundra Ecology
- Vertebrate Ecology
- Insect Ecology
- Ecology of Flowering Plants
- Arctic and Alpine Environments
- Microbial Ecology
- Stream Biology
- Palynology and Environmental History
- Ecology of Arid Lands

Advanced Environmental Biology II

- Ecology of Water Pollution (with help from Civil Engineering)
- Environmental Law (with help from the Law School)
- Pesticides and Ecology
- Ecology of Natural Resource Management
- Environmental Assessment (with help from Engineering)
- Ecology of wildlife management systems (possibly with help from CSU)
- Biology of fish populations
- Applied Environmental Microbiology
- Soil microbiology
- Aquatic microbiology

3. Essentials of Physiology. A team-taught course covering Plant, Animal and Microbial Physiology. To give students basic principles of Physiology and the fundamentals for the advanced courses.
4. Human Physiology. Primarily a service course for those in the Pre-Allied-Health programs, but open to selected majors. Enrollment would have to be carefully controlled.
5. A 2-semester sequence covering the organisms commonly placed in the Protista. First

semester to cover viruses to blue-green algae, the second to cover algae, protozoa and fungi.

6. A laboratory techniques course to give some training for those who would be going to try to get jobs as Lab Technicians. To include microtechniques and the use of analytical methods and tools.
7. Course to provide some practical training for students trying to get into the area of assessment of the ^{pharmacological} effects of environmental factors.
8. A broadening of Pathogenic Microbiology to include diseases of other animals and plants, rather than restricting it to human diseases.
~~(We need more explanation for this)~~
9. Problems in Biomathematics. Mathematical approaches to the analysis of biological data.
10. Human Genetics. Application cytological and population genetic principles and methods to humans.
11. Mammalian Physiology. An advanced course that would primarily introduce the student to the specialized techniques in this field. (It will require a highly specialized lab, however)
12. Plant Nutrition. To cover the nutritional requirements and utilization of inorganics in plants in detail.
13. Simulation and Modelling. This would be a detailed examination of modelling of biological systems and the use of computers to test these models
14. Statistical Genetics. *(Explanation is coming)*