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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.

11/6/74

DATE RECEIVED:

Routing:

	<u>Initial</u>
April	_____
Abbott	_____
Bailey	_____
Hersh	_____
Hanley	_____
Rogers, Dave	① <i>DR</i>
Rogers, Connie	_____
Louis	_____
McArthur	_____
von Borstell	_____
Jose Saldana	_____
Secretary	_____
_____	_____
_____	_____

Filing:

Original *Put in my personal*

Copies: *FAO file -*

In *✓*

Out _____

Internal _____

Administration _____

Fiscal/Contract _____

Organization _____

Project _____

Proposal _____

COMMENTS:

for old times



Sent courtesy of Jackie Harlan,
U. Illinois - Mar. 20, 21.

Büyük Efes Oteli

IZMIR - TURKEY

PHONE : 39500 -- CABLE : EFES, IZMIR -- TELEX : EFES, 41

Dear Gail:

Strange as it may seem, the most immediate communication to you is the route I am using. I am now here in Turkey at the organizational meeting of the regional center - organizing again, the same thing that has been organized by FAO at least 3 previous times. But this time, Sweden is putting up the \$, so they need to get signatures from each of the 6 nations of the region -

Here, I had to put on the same general job on "documentation" that I have put on many times before - and I don't think I have progressed one damned bit, because I had a whole new audience - the foreign ministers and their "technical" advisors from each of the six nations: Turkey, Afghanistan, Iran, Iraq, Syria and Pakistan (except that the delegates from Iran and Iraq didn't show up because they're fighting each other).

But enough of this - I may come back to it later. More important is our future in the whole mess. Unfortunately, I see no chance that we can do the job through FAO. There is simply too much politics in that structure, and no capability for an operational program.

over

But there is some hope through a newly organized 2.
International Board on Genetic Resources, established at the
direction of the Consultative Group on International
Programs in Agriculture. This later organization is
the group that put together all the international agricultural
research stations, such as IITA, CIMMYT, IRRI,
etc. The C.G. is made up of the World Bank, Rockefeller, Ford,
USAID, Sweden, Germany, and a few other "donor" countries,
and a few representatives from the underdeveloped countries.
Both the C.G. and the Board were set up because, essentially,
FAO could not do the job it was supposed to. The Board
will act for the C.G. on matters concerning genetic resources.
The Board will make decisions about what organizations
around the world will be supported to do GRC work,
and also, supposedly, be a fund-raiser for those
things they need.

The Board ^{will} still ~~try to~~ try to work with FAO,
having established the permanent secretary in FAO. But
they have built in a guaranteed failure there - Pichel is the
secretary that was appointed, because he is the chief
of the Unit for G.R., and, therefore, a natural for the
job - but he and his ~~own~~ secretary (you remember her -
she was the "cheerful" one that worked for the conference
you attended last year, named Averil ~~Zaid~~ Zaniboni)
will cheat things down before they get to the Board's
attention, at least for long enough to do mischief.
And there are many means useful to screw things up,
such as sending out letters via the Italian mail
instead of putting them in the diplomatic pouch,
or claiming that incoming mail did not arrive
on time, or that one of a number of other things just
failed to happen to anything that threatens them.



Büyük Efes Celi

IZMIR - TURKEY

PHONE : 39500 - CABLE : EFES, IZMIR - TELEX : EFES, 41

Almost from the moment I arrived, I knew that Seem lost his job because the Director of the Plant Production Division - Albanian - was a weak man. Nothing yet has changed my mind on my first impression. Hence he who let the situation with Bennett develop, (and that is a story you wouldn't believe), and it was he who could not side with his own staff when Otto Frankel started leaning on him. Frankel wanted Seem out because Seem wanted to change the direction of the work from an intense concentration on the cereal crops to one that allowed other threatened crops - in the tropics - to be included in G.R. work. But now Seem is out because of Frankel's machinations, and is replaced by Pichel who doesn't know anything about any genetic resource. Pichel before (when he had the job earlier) had blamed an Bennett for whatever he knew, and she, in turn, on Frankel who was calling all the shots from the outside. But it was Seem who started getting the money in to do the job - it was his efforts that raised about \$100,000 for the unit's work (above its regular former budget). Now Pichel walks back in and he, Bennett and Frankel claim all the success with the Unit. God, what a bunch of shits. Pichel is a drunk - from morning to night. But he can make a bluff of a situation so that a newcomer might think he really is a good administrator. As far as playing the right game in FAO, he is good - but that just screws up the work of G.R.

Ovav

4.
Another problem for us is the closed-shop approach used by the FAO computer group. Without a line item in the budget, nobody gets in to do work, and now there is not a single dollar in the budget for the whole Plant Production Division. The computer guys are straight - they have tried to help the Unit before, but nobody in the Unit (including Seno) could figure out what was needed, and so no budget item was submitted for this biennium (which started in January). This, at approximations for the budget as submitted in April this year for the next biennium, no advanced planning is absolutely essential in this outfit, and nobody is capable of it - they're too damned busy with politics - keeping the delegates from Africa from shooting down the delegates from Asia, from shooting down the delegates from America, and closing the book on the Africans.

This is why the Consultative Group decided to do something about agriculture outside of FAO. The International Board of the C.G. will have its first meeting in June this year, and we should be preparing our budget and plans now for that meeting, but Pichel can't seem to get it together. I've tried, but without any luck to get him on track - He has read (or should have read) your paper for the book. I have given him a 30 page boiled-down version of the same. I have given him a flowchart to follow on necessary decisions, a list of priority staff and space and equipment needs, and a couple of other papers to give him all he needs, but to no avail. He will not share with me the budget breakdown, nor how (if he knows) he will spend the \$. His mind (which is pickled) goes towards business as usual in FAO.



Büyük Efes Celi

İZMİR - TURKEY

PHONE : 39500 - CABLE : EFES, İZMİR - TELEX : EFES, 41

It took until last Friday to find me a temporary office. I don't have a secretary (but must use the one who ^{was} ~~is~~ subservient to Leon). Space in the building is nonexistent, and I suggested they rent an apartment across the street for us, but that is beyond their thinking ability.

So far as I know, the consultancy papers for you and Jim are somewhere in the mill - you may have received an offer by now. You might as well take them - we can map strategy better together. We might be able to have you ~~leave~~ ^{come} in Rome when the Board meets. That is in June - But you should be here a couple of weeks before to help sort it out. Jim should have the documentation of TAXIR with him - we will have to work out of some service bureau, and he ~~is~~ can get some idea of the work to be done to run it - probably on an IBM system - CDC doesn't live in Rome any more, but may be up in Milan. Here in Turkey, I've been talking to an eager beaver type who runs a service-center with an IBM 360/20. He understands that he can't run a full IR system on his hardware, but he wants to take on pieces of it - he figures the GRC would be a good advertisement to his other customers, and is looking to enlarge or update his system to some 370 type - of course, I can't give him

20/47

details on the main function of TAXIR, but I'm keeping him on the string. He may be the guy we need to make connections to other hardware in Turkey.

As for myself, they still are working on my application for a permanent position, and it is somewhat hurried in the mill. I'm waiting till the offer comes, and then intend to lay down the requirements before I accept. But I'm not sure now that even if they met the requirements I could do the work with two layers of crap - Pichel and Albani - to get through. The idea of a contract - even though I've brought it up - either doesn't get through or else they refuse to accept it. They have already announced that they have "an international expert" here, as though that is all that's needed - this last bit was Albani's statement to the organizing committee of the Board. He apparently used that announcement to try to convince those guys that FAO could do the work.

Anyway, I'll try to keep things going till we can some sort of action. But, after being ^{been} here in Izmir, and talking to representatives from the countries involved, I recognize the enormity of the job - it is incredible. Right now, I cross some real action - it has been hell to put up with all the bullshit. Connie says that it was a good thing she came along to see and experience it because she wouldn't have believed me if I had come alone, and then tried to tell her about it.

Well, this is long enough already, but I had to give you the picture as I see it. I hope it doesn't scare you off, and I hope we can get together soon. Be sure to bring every damned scrap of receipts you can, and charge it off to the FAO

Regards to Nina -

Yours -
Dave

Dear Dave,

FEB 12 1974

I'll try a several dates approach and see what I can recall at the end of each day should there be anything of note.

2/11/74: The weather is balmy and wonderful and will last so for the rest of the week. AM meeting with Russel Dohrman of the computer center. He's some type of assistant director. The meeting concerned what I found out from Dean Sawin- that there was (is) since last July a experimental course development fund which was to be jointly administered by the CC and the various schools (colleges) on campus. I understand it was from \$100 to \$200,000! Virtually nothing has been done with the money with the exception of the engineers. I guess this is what old Kruger was talking about when he mentioned some sort of project with the other schools- and what we could do to help them. Anyway I talked to Dohrman about the continued development of EXIR and how it could be used by the schools for teaching and research. He is interested and said that we should work out a proposal with the CC and then have the deans submit it to the CC. This is ok with Dean Sawin and Dean Baughn. It may come to pass that we can get a \$30,000. budget to work on EXIR here at no cost to us. This may also include the maintenance of all the taxinmetrics systems and their being placed in the library.

Time will tell but it is clear that some of the things you ~~were~~ may have wanted to do will be done.

The teletype terminal is getting some more use. We found a way to use it as a keypunch and the students are delighted. So are some of the other non-taxinmetrics students and I have a hunch that it might become more popular to use the computer in this department than before.

The Zea project will be out by Monday. Jim will have complete the RESEQUENCE DESCRIPTORS command by that time and we will be able to do more than ever before. He is about 70% finished with the documentation and has cleaned up about 50% of the original TAXIR bugs. The CC has agreed to correct the Klapakeh bugs and will do so shortly.

We are trying some new things with the ZEA which should really assist us when we have to use the general maintenance system in Rome. If it works I'll point it out in some detail with the copy of the ZEA I send off to you.

Peggy Shipley was over here today and went over the book with Susan Gammon. She has some questions which they will formulate and I will call Appan to see if he can answer them. If not I'll call you. They want to move with the book before prices become even higher than they are now.

Your friend Sam Sushan has asked to borrow a bookcase and has written a receipt for it. A copy of the receipt is in the files and another is with Liz Owen. I wouldn't trust these folks here as far as I could.....

Jay is working well, and he has carried the brunt of the model development and today we begin to wrap up our report to the AID people. Harold wants a song and dance for the first week in March. He is really interested. I will try to have a planning grant on the manihot then too, although Appan has not sent his draft yet. I expect that he will do so some time today.

There is a post-doc here who is interested in the tropics. I forgot- his name but he is known to you and Yan. How about using him as a cheapo post doc if appan should not be able to actually be sprung loose during the planning grant period?

Well- let me know what you think on this. I'll set a draft off to you as

I am also putting together the formal draft of the EXIR development schedule and testing procedure as we have discussed it. This can be considered to be Appendix three to our paper and part of the operational plan for Rome. I will send a draft for your alterations by Monday next.

We will be able to get some time on the IBM 379 here which seems to be similar to the system in Rome (except the Drums). I think we may be able to see that Jim gets some pre training in the system and probably start the conversion to ANSI standards on the IBM machine. More on this later.

Please send any instructions you want me to know. I am going along with the policy of keeping everything possible in front of your colleagues as if you were not gone.

Be well, love to Connie Gil

February 8, 1974

Dear Dave,

The consultancy forms arrived today. We will complete them and get them back to you ASAP.

Professor Dr. Shushan asked if he could borrow an unused bookcase. I thought that it would be worth the loan in view of his bitching that it wasn't being used and we were keeping him from doing his work etc. He will write a receipt acknowledging that it's yours and he'll give it back.

We spoke to Harold yesterday. Man, according to him they're very excited about the work we've been doing and Marty Foreman wants us to continue working for him. There are other repercussions and HR wants a song and dance from us in March.

Nothing else worth mentioning- you're going to be in the faculty notes several times in the Silver and Gold and some people here really miss you. I'm glad to hear that.

More later- be well and love to Connie-

Gil

PS- oh yes- enclosed is our statement of accounts effective 2/1/74. I have prepared this from the director's reports and our files. They are accurate to * \pm 5%.

For a fast interperation, we are in very good condition. More on specific changes and possibility of other money later.

Your work on Harold about my dissertation went well. He wants me to continue to work for them, but really laid it on me about finishing my work. I will, old man.

Regards from Jay.

- Susan Samman is "98%" finished with client
with Shirley today.

Rome, Feb. 26, 1974

Dear Gil and Jim:

This is a long over-due report, and one I have to send as a private letter, because of the insecurity of the official channels. Too many people get their hands on the official mail to let you know really what is happening. First--your medical history and personal history forms came this morning. Now, there is a long song and dance (time?? maybe 6 weeks). They have to get some sort of security clearance for you. Gil, you may have one already, but I guess that you, Jim, will have to go through one. I'll try to keep you posted. You can get things to me through regular address, marked personal. So far, they haven't opened those. ✓

The place is as bad as I expected--a maze of red tape, passing through little gray people who dart in and out of closed offices, who seldom speak, but have their eyes averted, slinking up and down long corridors (gil, you remember) and mostly bent on their coffee breaks. And the coffee--ugh! I don't have an office yet, and they're predicting the 1st of June before I do! Nor a secretary. My own job has just gone in for consideration, and I have no idea what my competition is, except for one guy, namely, (and Gil, don't bust) Abraham from India! I kinda hope he gets it. Otto was successful in getting Leon kicked out as chief, and in his place, ~~is~~ a Belgian, Pichel, has taken over. Pichel is strictly an administrator, though he was in this job 3 years ago, and came back after being slipped sideways. He is Frankel's choice. We will have to carry this guy on our shoulders, because he really can't put an operational program together. But he is really "good" according to accepted standards. Leon is still in the same Division, but with the job as director of the seed exchange program. He will still be around, but we've lost a damned good friend in this unit. I've visited with the director of the division once, for coffee. We've lost personnel in this unit, but the job has increased, because a new function has been added that is just a secretarial position (but this means the chief of the unit) to a new international board for genetic resources. This board is a subcommittee of the Techn. Advisory Comm., of the Consultative Group for Agricultural Research. This last outfit is made up of all the "donor" countries for world agriculture, and one of its functions is to run all the so-called international agricultural centers, like IITA, CIAT, etc. This is where any real scratch will come from, but FAO will have to compete for the \$ against all the international centers. We're in trouble, with our present arrangement. I have been writing a background paper to explain the documentation function--they don't have a clue as to what it means, and I've attempted to get an understanding to them in a superficial way, so they can begin to see what's involved altogether. But how the hell to get them to read anything? I'm also trying the route of after-hour cocktails, but can't get anybody I want to tell something to to come and listen. I've organized a seminar on documentation, but will catch only the little fish there. The administrators are too busy. Otto's friend, Erna, is tied up with a committe job on staff administration, and isn't paying much attention to the work here. I think they're planning a temporary P4 job to replace her, and maybe we can pick that up for us. But all-in-all, there is really a big opportunity here. The guy in charge of the comp centre, Wrigley, is pretty good, but his machinery is too small, and we will probably have to go to an IBM service machine in town, or maybe in Geneva to get what we need. I'm waiting on both of you to help in sorting that one out.

Personally, things haven't been too bad. We have a temporary furnished apt. til April 8, just at the end of my consultancy. But it's a nice haven for now. Costs are astronomical, if you're looking for something convenient to FAO. The weather has been pretty good--I don't think it has dipped below freezing since we've been here. Some rain, but mostly sunny and pleasant.

Sorry I haven't had any space to say anything about the good things you're doing, but I am happy to hear your good work. Give my regards to one and all.

Yours,

22 May 1974

To: DJR Confidential

Notes

the following deals with the concept of our agreement with
FAO/AGP. It is based on several assumptions, some of which
have had some evidence displayed to back them.

First, is lined out the tenets of the agreement; second the
assumptions; third the work we must do to have this agreement
negotiated and ratified.

level
A. ~~#~~ that we, acting as the Taximetrics Laboratory-agroup, will
provide to FAO/AGP the expertise, ~~whendpandhngmnmnmnmnm~~
and the computer based programs that we have developed,
~~the "mnmnm"~~ ^{credibility} access to the ~~"mnmnm"~~ that we have created
~~whillexoperatingxommpmjsotax~~
~~in doing projects for the field of genetic resources work,~~
a work plan for further ~~de~~ analysis and development of the
problems of genetic resources work and especially as they
apply to the problems of documentation, and the execution
of this plan of work.

*decision to
continue only
if needed.*

The results of the plan of work will be to 1) ~~provided~~
to FAO ~~the basis in fact that they have the capacity and~~ ^{to change to sponsor & assist in}
expertise to carry out a role in the area of genetic resources
and that, if they choose, can continue to control the work
of development and coordination of the documentation function.

This is especially to be demonstrated to the decision makers
in FAO at higher levels, to the community of workers and
especially to the International Board on Plant Genetic Resources.

provide FAO with might be termed here the "right of first refusal" to support the tax group in its work. This means that at several times -clearly specified- ~~nothing means~~ the tax-group and FAO can determine whether the mutually beneficial work should continue.

see work
see time
phase

- 1 The Tax group may decide to give up this line of work, but must provide to FAO sufficient time to transfer the expertise to it;
- 2 The Tax group may decide that FAO has not met certain specific conditions- and this must be ~~to~~ negotiated ~~out~~; or that certain conditions for successful operations cannot be met by FAO and they wish to transfer to the auspices of another organization. *How? under contract?*
- 3 FAO may decide it does not wish to continue with the program or its policy- and must provide sufficient warning of this; *ok*
4. the tax group cannot meet certain specifications and FAO must transfer to another group. *ok*

after
decision made <

only at the decision nodes

In our terms of reference we will proceed through the first phase of this transitional period (through December, January 1974). After this time these aspects must be reviewed carefully. It is sufficient time to give FAO a chance to see the value of our work given their ~~pa~~ objectives (external and hidden) and us a chance to see if we can work in concert- or whether there is ~~ismambettampbanambanwork~~ an organization whose ~~asupecies~~ will better meet our objectives (external and hidden).

B. Assumptions

1. Taxlaä

-- That our current expertise in all areas concerning genetic resources documentation and related problems is far and above those available from any other source. That this has been demonstrated on a pilot basis and that we can continue to demonstrate this. (This becomes a part of the work plan)

-- that we intend to continue working on this problem in the near future, and though we may have other objectives as well from the development of this expertise we will give primary attention to the genetics resources problems as long as financial and working conditions are met.

-- that several of the other objectives are based on the use of the systems we are developing and the same general area of assisting scientific work to be more readily useful to the scientific community.

-- that minimum financial arrangements must be met for the staff for a minimum time period.

How
See
11

— that a good deal of scientific and research freedom be allowed to execute a decided upon work plan; ;.

2. FAO

- That they wish to continue their involvement in the area of ^{plant} genetic resources; — at least ~~make~~ ^{make} the first phase that they wish to ^{explore} have a major role in the coordination and development of some aspect related to plant genetics resources, ~~this to meet the needs of the objectives (both external and internal);~~ ^{really only have to extend to Jan 75} ~~all~~ that they have decided that they can make a major impact in the area of documentation (~~and~~) that this is based on their thinking that they have the best available documentation group; that they have the funds to contract for a ~~sub~~ the necessary effort at the present time.

~~that they will present a~~

that they ^{may} wish to ~~do~~ present to the Board a well thought out proposal for the expansion of the Doc function - but will do so after careful study

- that they will request to work closely with a board subcommittee on doc.

B. The work plan is based on the following:

1. the steps needed to negotiate an agreement with FAO that is based on the assumption that their objectives and ours are very close to being 1:1, and that only small details have to be worked out.

negotiated, address the development and operational aspects almost as separate entities
On this basis we must be able to do the following:

develop a detailed overall plan for the coordination and development function. this to include the sets of policy statements that should be ~~am~~ made to the Board by FAO ~~(even)~~. from this develop a transitional plan of work that will move FAO visibly in the direction of carrying out the task of development and coordination.

the coordination effort for the development period should not be spelled out in detail to that amount would be complicated provided to F.A.O.

present to FAO (albani and pichel) this work plan and ~~the same~~ the operating provisions for our undertaking this work. Specifying the conditions that must be met by FAO at once (immediately) for us to continue to the next step.

if agreed work out a presentation strat with FAO for the board meetings of June and October (or better December).

then begin to execute the plan.

work out a strat to present a paper of description of the system to the board - that it be shown that this work was sponsored by FAO. - that it will be the basis for further work

B 1974 B B 1975

V VI VII VIII IX X XI XII I II III IV V VI VII VIII IX X XI XII

1. Planning & Development
Based on pilot project Approach

prepare board for formal application. for centre work & data.

2. Discussion/decision
point to continue or to transfer ops
Initial information

formal proposal submitted. cases will continue with good faith

3. Operational
Begin operational phase

formal coordination assist

RAO (1) Tech Train → center

Asst (2) info work flow

(B) ~~Asst~~

4. evaluate continued operation

5. Coordination/operation

We will jointly with FAO and the
Board sub committee - but keeping our
identity will ~~also~~ prepare further
details of analysis for the Board as
a rule of the info system. about
so and other areas.

VJ
1/12/72
JAB
FAB

III. The FAO role and coordination

A. ~~xxxxxxxxxxxx~~

the meaning and ramifications of a coordination role at this time

1. basic information and assistance in the analysis of this information.
2. the continued and active role as coordination personnel and budgetary ramifications.
3. the systems development ~~xxxx~~ role (the ability to provide to selected ~~xxxx~~ organizations the capacity to break their technological barriers with respect to information flow in a micro sense; thus assisting in the ~~xxxx~~ control and development at the macro level.

B. The FAO with respect to the IBPGR at this time

1. The Board needs information it does not have and which is not immediately available. It would be useful if FAO could provide ~~the~~
 - a. the information
 - b. the means of continuing to have the information in a systematic and updated manner
 - c. available to the board through FAO the capacity to do complete C/E analysis and planning patterns on this information.

C. a suggested strategy

1. FAO not push the board but present a proposal which ~~xxxx~~ phases all of the above in perspective (including the ~~xxxx~~ method of analysis and the on going pilot projects.) and which suggests that FAO will continue to sponsor this work and that details of it which are needed by the board for planning at its next meeting will be available and that FAO will present a further proposal with respect to CIDS at that time. It will also have some specific operating procedures to show the board as a result of the expanded pilot project,

To do this the following is requested on the board in this proposal

- a. that a task force (or sub committee) from the Board be formed to work with the TL and FAO on this problem and the work that will be done. This ~~xxx~~ work group or sub committee will ~~advise xxxxxxxxxx~~ observe the work in progress and will advise the TL/FAO on various matters involved. They will be knowledgeable about these problems and will be able to report to the Board first hand at a later date.
- b. the board recognize this work and that upon more information FAO may wish to submit a formal proposal at the next meeting on that is carefully thought out and based on actual hands on experience in the problems of CIDS analysis and development.

2. FAO retain the TL to continue this work as stated below to

- a. the Human Resources Committee for Board and DEX intervals
- b. work with FAO to develop a presentation at to the board on

- this work
- c. assist FAO in preparing a aids coordination proposal to the Board for its next meeting
 - d. prepare a series of articles (for Crop Genetics Resorurcse newsletter or other publications on this work.
 - e. ~~ixxxpaxxxkxxATAXIRxxsystemxxforxxportabilityxxpartabilityxx~~
 - e. t make the TAXIR system portable so that in the next phase it can be install on a computer for FAO use and one that is designated by FAO (of course this sytem must be able to meet certain operational critiera).
 - f. to damonstrate that the system can be transported on an international basis it will be installed on one of the computers used by one of the groups involved in the pilot projects.
ⁱⁿ stallatikon will entail ~~axxxixy~~ preliminary developdment and use of manuals needed to assure independent operation of the system once installed. These will be preliminary beacuse there will be changes made in them as required' and this pilot installation is also a developmen t ph ase..

i

IV. work plan development

Define the nature of the pilot projects and the manner in which they can be altered to meet specific FAO/Board strat ~~xxxx~~ needs.

- a. solanum
 - all collections up
 - expand to take in the euporpean collections
 - a trainee funded by FAO for this project, higher level type to work with TL
- b. ZEA
 - continue by expanding the sample size to include complete collections of those participating
 - expand the participation list
 - put on a trainee to assit in this project
 - this would include the active collection analysis at CIMMYT²
- ~~mm~~ also possible computer installation of TAXIIR at Colombia in conjunction with CIAT
 or at Chapingo in conjunction with CIMMYT²
- c. VIGNA
 - continue the work with IITA for their catalogs and other needs since CIAT will submit a proposal on cowpeas at this or the next session it might be possible to get all the major cowpea collections in and do a basic analysis of the capacity to handle this within the organizations strcutres.

in conjunction with this do an analysis of all cowpea personnel and organizations

included also is the possible installation of TAXIR in the computer in Colombia used by CIAT for the purpose of assisting their work on Vigna-

d. USDA

work on the USDA NSSL, based on the previous work. Installation of the computer system there. Getting arrangements for proenance data and control data for major and relevant portions of their collections. work this through jointly with USDA Jones with possible assistance in funding. Also explore the possibility to work with UUUsda7AID on the problems of major us working/active collections soybeans.

V. details of an operating contract with TL

1 funds (change the budget to include at data manger-up grade by 3-4k

contracts- now

work site during the first phase, Unive of colo
Rogers to supervise
regular reporting and site visits to Rome
Pichel to CU

this must be done asap

VI strat for actual presentation to the board

if the above is agreed upon,

what is the best approach to the board
what written documents are needed
who should make these presentations
is an informal lunch to launch some of these ideas possible

how shall we work this with ALBANI

briefing for DJR

1. meeting with the working committee on base collections

Tuesday- general explanation from them (Roberts) with some input from us on computer (information) systems use for control and maintenance functions in the GR base collections.

see the ~~attached notes~~. There was some good and useful information for us in this. *see notes 1*

Wednesday: pm I was asked to attend the ~~mm~~ sessions- the topic was documentation for base and active collections. Pichel was present for part of the time. The basic question asked was where should the documentation center be located. There was some considerable discussion about this and "rankel" at ~~mmmm~~ first was a bit obtuse. I then explained by way of scenario that there was an entire range of possibilities. This began with the service center single center concept and moved to the ~~to~~ other extreme wherein every working group had a documentation center in their facility. They said that this was necessary but at what level could some network communication be reasonably expected. It was at this point that Pichel said that the basic function of FAO was the coordination of such communication but it was not clear how this would be done. There were considerable questions raised- in general the summary follows (see notes 2)

Continued on the reverse

2. meeting with Pichel 16 May 1974
summary and notes - part 2

BASE collection

Wednesday 5/15/74

the basic question that was put to us by the working group on base collection operations was by Frankel. It was not well stated but centrally showed the confusion of the members of the ~~the~~ working group concerning the ~~main~~ manner in which the documentation role should be fulfilled.

essentially the question~~s~~ was:

where should the documentation centers be located.

It was Otto's opinion that they should be somewhere near the base collections- but not necessarily a task of the base collections.

The debate, rather uneducated, went on for sometime among Hawkes, Otto and Roberts- each adding an opinion to the debate.

I proposed that we have a complex problem- essentially who should have the system and the who will have the ~~exact~~ capacity to use it- this is more immediately the question than who will have ~~the~~ be the documentation center.

As the time passed the following was worked out- there are two extreme cases, one in which there was one central documentation center to which all information was fed in and all answers were fed out. There would be back up points or centers for this, These backup centers would be a safe area in which there would be a computing center of sufficient size to handle the work and in residence would be the systems tapes and the up dated documentation tapes.

This case was then on the extreme. The other was that each collection center would have the systems for its own ~~use~~ use and would have their own collections on record with nothing to coordinate the formation of a communication network so that information could be ~~passed~~ exchanged or requested.

Clearly the latter was met with complete scorn. This would defeat the purpose of any type of communication network- while the former appeared to be to grand scale- it was seen as likely that it would be financially and politically infeasible. (Although I doubt this). There were then the questions of the mid ground- given all the objectives and the constraints where could the mid ground exist and how could the

network be made to function.

It was then told them that as scientists now acting as planners they should clearly realize that they do not have sufficient information to make these judgements. When one begins to talk of the optimum and the feasible one needs some information and this information is not yet available although it can be gotten by a careful research and demonstration design as we have been following. It is that FAO could be the central point for carrying this out- although it cannot be done ~~from~~ from Rome.

The group understood the concept and that there was need for this project- they left with the feeling that:

- 1) the problem was in good hands
- 2) they essentially endorsed the research and demonstration phase wherein by actually working with the pilot projects and expanding some of them we will be able to determine the best type of operations at the start and how to continue from there;
- 3) that in a future meeting this group (or another) should appoint a policy board or panel or whatever that will be able to set up the rules for the operation of the international network. These rules will be few and simple- essentially a) who can input material and what are the rules of becoming an inputter;
b) what minimum standards must exist for sending information and for each crop what is the minimum amount of information that would be acceptable; c) who had the right of asking for information- and how could these requests best be met. (Otto was of the opinion that the output would be impossible to reach. When it was shown that a requestor could also request the form in which he wanted the output

accomplish what he had dreamed of.

I did not open the debate of how any group would pay for the query service.

The ideal situation was then presented in the form of a debate between Roberts, Hawkes and Otto with Sykes and Picjele making comments on the role and function of FAO.

The outcome was determined when I told them that they could each have what they wanted- but again they must be willing to wait until there was more information- especially of the type to deal with the problems of the operations of the network.

the suggested set up would include:

all active collections would send their information concerning their collections and work they have done on them according to a set of rules to either the designated and accepted center for the region (all crops) or for the specific crop (international). then either the regional center of the international ~~cent~~ crop center will send the information to the other. For example, if the crop center receives this information then it will send copies of this (in the mode of pre-formated tapes) to the regional center. These two ~~groups~~ groups would then maintain comparable records. probably queries will be sent on specific crops to the crop centers ~~which~~ the regional centers might be more involved in the coordination of collection base collection maintenance etc for a given region- and would not be crop specific- these centers also might be the areas in which area dependent crop trials would be done. if this were the set up then two things are exceptionally important:

- 1) that each responsible center ~~make~~ include in their budget sufficient funds for the real operations of the information center- and that this center meet the standards imposed by the international coordinating committee as supervised by some agency FAO,
- 2) that at the coordinating center- carrying out the coordinating committee wishes several things happen:

a) continued research and development be made into the various

operational problems of the documentation/information set of problems- and that this research group- although small would be able to up date and install the system to keep it as effective as possible and to meet the changing demands of the research workers in the field. That this group be controlled by the coordinating operation (possibly on a contract basis)

- b) that the coordinating center receive the tapes from either (or both) the regional centers and the crop centers around the world up dated on a regular basis and that the coord center act as an archiving group for the purpose of back up.

also the coordinating center have the capacity to actually check to see what standards are being met, what active groups are doing, what they are in need of concerning information systems (as n to assist them as needed) and to carry out an information program for all possible users concerning what ~~infora~~ information resides where, how it may be accessed and what type of work is being done where. This can be ~~te~~ ~~ent~~ obtained through the use of a regular publication and in specific answers to important queries.

- c) that the coord center will assist in all funding requests for this type of work.

it was basically agreed that the key elements of this above are:

- 1) the development of a system (TAXIR) which can meet the needs of each active collection and each international crop or regional center

that the system be able to be installed at or near these groups to make its use general for the coordinated documentatin purposes;

- 2) that a coordinating committee exist that can carry of the experiments that are necessary to ~~pro~~ provide the information that is needed for the design and control of the system networks as a whole

and that this coordinating center can assist the international board in setting up a group to work on the problems of the rules and set up of such work- (this group can work through the entire research period on these problems without formally meeting- but meeting after they have participated in the research and demonstration phase. In fact this phase should include as many people as is possible in ~~0000~~ this experiment.)

probably FAO should be this group.

Otto and the other accorded that their report should indicate that considerable development and demonstration work has been done on a flexible basic information system (TAXIR) for the purposes of Base Collection Documentation and the research, development and demonstration of the use of the system will continue. Further, the management specialists involved in the development of this tool will actively use it to gain the necessary information to assist in designing the international networks information/documentation system (that work is actually underway in pilot projects using actual data from active and base collections) and that these pilots will be expanded to sufficient size ~~#####~~ to provide the information and alternative to a group of decision makers concerning the network problem. The size may include several sets of entire collections. (both base and active) from around the world.

NOTES ↓

WORKING GROUP ON NETWORK OF GENETIC RESOURCES CENTRES

14 - 16 May 1974

- 1: Base collections - technical standards
Review of questionnaire and replies to date
- 2: Relations with active collections for multiplication and regeneration; responsibility for distribution ?
- 3: Duplication of collections
- 4: Access to material - base collections and associated active collections
- 5: Quarantine arrangements
- 6: Documentation
- 7: Legal arrangements with FAO
- 8: Definition of competence and responsibility within the network - crop, region, etc.

14 May 1974
GHE/amed

The meeting covered the problems of suggested standards for base collection environment and certain procedures. These that affected the use of information systems at the base collection are as follows:

- 1) receipt and maintenance of provenance data for all accessions;
- 2) paper flow and automatic ~~manip~~ control systems for information on initial germination tests; tickler file querying and set up of schedules for germination retests; adding information on these re tests and querying on ~~the~~ ~~basis~~ a pre-set rule for setting up rejuvenation schedules.
- 3) setting up and maintaining the paper flow for all requests for material and the answering of these requests; continuous inventory of the amount of seeds on hand and automatic query and set up of rejuvenation schedules for those accessions which fall below a given level of ~~seed~~ material on hand.

The system (TAXIR) as it currently exists can accomplish these tasks and there are certain design changes which can be implemented within the next year that will improve the effectiveness of meeting these needs.

another aspect might be automatic packet label generation.

Roberts presented the following- which can be viewed as the principal set of objectives of concern about the cost operations of the base collections:

- 1) most costly is sub-optimal scheduling for rejuvenation;
- 2) the next is sub-optimal scheduling for germination re-tests.

everything should be done to ~~maintain~~ maximize the time between the need for germination retesting and rejuvenation of the materials.

Most critical are the storage conditions and the handling conditions of

the actual germ plasma material.

and an information system of some automatic nature that can be effectively integrated into the operating system can assist in keeping track and scheduling of this work.

the rules for ~~re-~~ germinatin retesting and rejuvenation ~~wh~~ mustbe set up to assure a considerable margin of safety. It is clear that ~~000000~~ ideally these rules will vary from crop to crop. There is however not sufficienet information at present to ~~immbbhhm km~~ make up crops specific rules (and furhter a standard rule willbe much easire for human based information systems).

the suggested rules should be:

- a) initial acceptance for storage of an accessions should be at least 80% germ.
- b) all accessions should be rejuvenated every five years (tolerance) *decim*
- c) allhouse which have shown a 5% decline from the initial test should be rejuvenated;
- d) ther was no metnion of the minimum amount of stock that should be on hand. *but four packets of (400) seeds*

It was pointed out that should the crop specific information become available that the automatic programming of this could be done easily and would facilitate further minimization of cost while assuring adequate (if not optimal) safety margins.

The system could be made available to any base collection either by means of direct implementation of the hardware of the institute housing the base collection, through local service bureau arrangements or through long distance service bureaus which could be established.

The quarantine can demonstrate something
then to do some testing on the.

→ This can be the beginning of an
extended communication.

tolerance or viability loss of few percent
(due to mutation in storage).

→ What are the individual cost curves to go below
a certain or maximum temp. (Commercial data
to -70°)

these data do not appear to be an optimum
temperature.

suggested — extreme once / week at most
(sealed container) → working range — seed
→ ambient humidity

Standard test method / intervals — if
condition are good — used in frequent (5 years)

When should be the stock be regenerated
→ Should use 100 sample?

initial test

— rule for regeneration 80% or better

initial viability ~~85%~~ begin regeneration

routine tests (what interval)

→ what interval → (5 year periods)

Not only documentation but the information flow to
assist in scientific (and resource management)

[documentation is covered a sub set
of this

ref: fort Collins,

Hornstrom
James

How to handle the regeneration of

seeds her work over

the operational problems:

have are the greatest costs and
thus the greatest resistance to change.
the greater the sets of
abstraction

Roberts



→ [labelling problem
paper tracing problems

the simpler systems

(1) most important and critical aspect
is sub-optimal rejuvenation.

(2) the next is the system and schedule
of routine tests.

- constraints (rule of thumb data) for all species

accumulated profits
(min sample size)

(2) # of seed sample for test
how many.

→ based on the intel. germination

standard storage procedures - for cost etc.

from this first session it is clear - relatively - that what are some of the information that should be traced through the seed genetic resources center formal base collections:

date

(1) initial viability trials - date, %

(2)

(2) the system should ask and schedule the next set of ~~at~~ viability tests (germination tests)

this should be in the form of a standard question - for scheduling.

(3) the new viability info should be input for up date - date, % viability

(4) the cycle q. should select do the following calculation:

print: () ^{cycle date} ^{limit} for those with
most recent Germ test n - ~~germ test n+1~~ [<] 5%

The immediate conventional TAX IN
Approach is

This is their

~~The other co~~
9 could be

PRINT (TAX) MOR # \leq 0%
~~and date of last~~

This will meet with current convention.

The paper flow should be based on the action of the technicians with no interpretation by them - just a standard flow through the system.

Subsidiary client report can be made of all those below a standard for record if needed.

notes 2

Pichel- FAO's role is coordination but we cannot be clara at this time what this means

Hawkes- all working people should be willing to send their information to at least one documentaiton center. This center should be either a crop specific center or a regional center for all crops in that region. There then might be several ways that this would work but in essence either or both would have information about everything either in the region or about that crop. These two groups would have to work out the exchange of e information.

there was some general agreement on this when they were told that this was possible and that due to the TAXIR system there was little to complicate the technical problems of exchange and use. It was suggested that all use the same system for the puspoee of sharing. This seems like a good idea but it might break down if there was an attempt to enforce it - but as long as the data was machine readable it was possible to make conversions. The group was impressed with the scope of the TAXIR system.

Roberts- he flet that the nexus of the problem of an exchange network was to get the information fed back from either working collections from the breeders or from the active collection areas to some center. The problem is to induce or coordinate ijn such a way to get response on a regular basis. This is not an easy area to deal with and I ppinted out that the only ways to assure compliance was to have something that the other wanted and would not get unless he complied. It is possible to think of several of these tradeoffs büt as with the question of what would be an optimum workable network scheme we should study the problem while while doing thw ~~re~~ work and possibly in 6-9 months from now we could make certain judgements on this. As scientist⁵

of a complex organization required information- especially if they wanted the organization to work and work according to some set of goals or desires. In order for this to happen a good deal of information would be needed and it would have to be gotten by experiments and observations. There was little difference between the experimental problems associated with their science and that of the management scientists except that we were called upon ~~much~~ too late and we had to produce some immediate results. I said that the strategy we have envisioned would enable us to do something that could be construed as action and indeed to fill a gap that was needed to be filled while we had the clear opportunity to make the investigations as needed and to design for effect. They were interested in this approach or thinking. I made it clear that it was a mistake to assume that any group could get on with this and this general approach and attitude was usually paid lip service but not heeded.

Otto asked me to write a small paragraph for the working papers. This is attached. I also assisted in preparing the statement/ definition on documentation in active collections. I also prepared the notes on the definition of a documentation center (which was used in the paper).

attachments:

- 1) paragraph on base collection documentation
- 2) definition of documentation center- general given to *them* *eyes*
- 3) requested list of terms for ~~general~~ standardization ✓

definition

ATTACH 1

17 may 1974 draft of comment for working committee meeting on base collection,

4. Documentation

- Complete records must include a) basic provenance data;
b) maintenance and control data; c) requests for material; and,
d) shipping data.

This information should be maintained in such a way so that:

- a) there is a coherent system for handling the information associated with each accession as it is initially and subsequently processed;
b) this information is stored in a systematic fashion that will insure against loss- this will require a backup set of records;
c) this information can be systematically retrieved as required for the following purposes:

- (i) to accompany samples provided to active centers;
(ii) ~~to assist systematically in standard maintenance~~
maintenance and control of collections including scheduling of germination tests, regeneration due to reduction of viability or depletion of stocks.

- d) to facilitate this set of information requirements it is suggested that an effective, computerized, general information storage and retrieval system be utilized whenever possible; however, the entire information process should be designed so that it will function manually if necessary.

Tracked

(1)

continuous list of terms for standardization

with reference to Base Collections

1. regeneration (rejuvenation)
2. germination testing
3. most recent germination test

with reference to documentation and information systems

the parts of an information system

the data base

the storage capability

the transmission mode

the retrieval capacity

the search key or method

reference to manual information systems

intergrated information systems

paper flow and process

machine readable format

standard format

computer center

computer configuration

operating system (computer)

operating environment

job mix

load factors job audit day file

information recording

recording format

precision

other terms
 data and information
 descriptor / state
 characteristic
 attribute
 measurability
 quantitative measurement
 accuracy, percision
 p¹¹atter recognition
 information standards
 parsing
 gerneralized information storage and retrieval ~~systems~~, system
 on line
 magnetic tape, disk tabular cards
 unit recod equipment
 coding
 source listings, object listings, machine language, assembly language
 statistics
 information analysis
 information synthesis
 systems analysis
 computer science
 management scinece/ operations research opeational research
 cost/effectivness
 optimum, sub-optimum, optimization, ^{mathematical} programming
 object function, ~~constraints or conditions~~ constraints or conditions
 information transfer
 economy of scale operations to scale
 development, planning, budgeting work program evaluation mointoring



CROP ECOLOGY AND GENETIC RESOURCES UNIT
PLANT PRODUCTION AND PROTECTION DIVISION

INTERNATIONAL NETWORK OF GENETIC RESOURCES CENTRES:
DEFINITIONS AND FUNCTIONS

A. Definitions

1. Centres for the conservation of genetic resources are to be termed genetic resources centres.
2. Genetic resources centres comprise either or both of the following components:
 - (i) Base collections for long-term storage;
 - (ii) Active collections (previously termed working collections), for:
 - (a) medium-term storage;
 - (b) regeneration;
 - (c) multiplication and distribution;
 - (d) evaluation;
 - (e) documentation.

These two components are necessary for the continued maintenance of germplasm collections and, if not in the same institution, collaborative links are essential.

Breeders' working collections are regarded as outside the framework of genetic resources centres, but use of genetic resources by breeders will generate valuable information which can be incorporated in genetic resources records.

we may also have need

B. Base collections

1. There are four categories of base collections:
 - (i) Substantial collections of a wide range of species;
 - (ii) Substantial collections of a limited range of species;
 - (iii) Significant and original special purpose collections;
 - (iv) Replicates of any of these.
2. Base collections - facilities and functions.
 - (i) "Base centres" must have adequate facilities for long-term conservation of germplasm (see 3 below).

- (ii) They will make available to "active centres" seeds required for replacing or renewing exhausted or unreliable stocks (see C2 below). Seed material in long-term storage must not be used as a source of seed distribution. This is the function of an active collection.
- (iii) Base collections, except for replicate collections stored under similar conditions, normally will be subject to periodic germination tests.
- (iv) Arrangements must be made for the duplication of conserved material in other conservation centres in order to minimise the danger of loss. This may range from mere acceptance for storage in the packaged form in which the material has been received, to the complete incorporation of the materials into the collections of the receiving centre, according to agreement between the parties.
- (v) The size of a sample to be entered into long-term conservation must be at least adequate to represent the population from which it is drawn with regard to breeding system and population structure and to satisfy foreseeable demands over a period of years.
- (vi) Genetic resources centres maintaining base collections are responsible for the maintenance of complete records and documentation of these collections. Methods of documentation will be recommended in the near future.
- (vii) *Base collections may need to work in collaboration with quarantine centres in accordance with the regulations involved.*

3. Working groups designated by the FAO Panel of Experts on Plant Exploration and Introduction will be responsible for establishing standards with a view to defining the conditions of storage required for the long-term preservation of seed and other material.

C. Active collections

Actual or potential use of germplasm is the only motive for its conservation. Though conservation is the function of base collections, an agreed procedure for the transfer of material from base collections to active collections must be defined, since it is through active collections that material is regenerated, multiplied, distributed and evaluated. Active collections will operate in accordance with the following guidelines.

1. A genetic resources centre maintaining active collections must include (or be associated with) a quarantine station responsible for inward and outward clearance of plant material.
2. Genetic resources centres maintaining active collections are responsible for organizing the regeneration of seed when required. This should be done in environments as similar as possible to those from which the original material derived. This may, and usually will, necessitate collaborative arrangements with other institutions and/or specialists. True regeneration of samples can only be attained under "homoclimatic" conditions, i.e. under conditions climatically similar to those from which the material was collected, or to which it was

originally adapted. Any other conditions will lead to a change in the genetic constitution of the sample. ~~Metero~~climatic conditions should not be used for ~~germplasm~~ sample regeneration unless unavoidable, and this must be recorded.

3. Genetic resources centres maintaining active collections are responsible for the maintenance of records of origin, treatment and distribution of accessions and for supplying copies of such records to FAO. Material supplied by a centre should be as fully documented as possible. It is a corollary of this condition that material supplied to a centre should also be as fully documented as possible. Documentation and exchange of information within the network should be in an internationally accepted form. Some centres will be able to take advantage of existing local facilities for computerised information storage and retrieval.

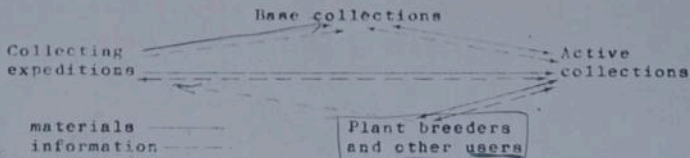
4. The efficiency with which samples can be utilised depends on the extent to which they have been evaluated. It also depends on the degree to which evaluation data are available to custodians of active collections, and to plant breeders and others who will be using germplasm. This implies a degree of commitment not only to an active programme of evaluation, but also to an international documentation service which can make data freely available to all potential users.

5. Genetic resources centres maintaining active collections are expected to carry out some or all of the following activities:

- (i) Exploration and collection of material, as a rule in collaboration with national centres;
- (ii) Identification and preliminary evaluation of material;
- (iii) Exchange and distribution of seed and vegetative stocks, including, where appropriate, the introduction of breeding lines and advanced cultivars;
- (iv) Initial planting of introduced material according to the quarantine laws of the country in which the centre is located;
- (v) Maintenance and storage of seed and vegetative stocks for medium or long-term preservation.

D. Flow of materials and information

The diagram summarizes the flow of materials and information from, to, and between base collections, active collections, and users.



E. Participation and coordination

Subject to the acceptance of essential principles and guidelines, participation in some phase of the network should be open to all institutions wishing to join. Indeed, broad regional representation is essential for the network's success.

2 Theoretically, all the world's seed reserves could be stored in one or two base collections. But there are cogent reasons for multiplicity of storages: ready access, regional quarantine restrictions, proximity to active centres, long-term security, expense, political considerations, and possibly others. The optimal condition might be a limited number of regionally distributed major base collections with mutual arrangements for duplication of stocks. For the time being, the availability of adequate storage facilities is the major determining factor in the siting of base collections.

3 Active collections, on the other hand should be as widely distributed as possible. Indeed, there is no limit on participation, nor on the scale of operations, from the large multi-crop institutions, to small crop-specific ones. Ecological diversity and full representation of crops are essential for all phases, from multiplication and regeneration to evaluation.

4 As far as is possible, access to material and information should be free for all - collections, plant breeders and other users. Where economic, technical or other reasons necessitate restrictions on free access or exchange, every effort should be made to overcome or limit the effects of such restrictions.

The setting of standards, ^{formulation} formulation of guidelines, and coordination of activities requires an international coordinating organization, in the first instance FAO assisted by its expert panel, but international agreement would be facilitated by a meeting of participants. *Which already is the responsibility of FAO.*

Recommended Conditions for Seed Storage
at Genetic Resources Centres

(Working paper for the FAO Panel on Plant
Exploration and Introduction, 1974).

E.H. Roberts

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1. Maintenance of genetic integrity. A large amount of genetic mutation is associated with loss of seed viability in storage. It has been estimated that a fall in viability to 50% produces an amount of mutation equivalent to treating fresh seeds with 10,000 r of X-rays; and about half as much mutation is produced even if viability only falls to 80% (Roberts, 1973). It is suggested, therefore, that long-term seed storage systems should aim at maintaining viability at high levels, say 90% or above.
2. Advantages of infrequent multiplication. When seed stocks begin to lose viability, the seeds need to be grown in order to replenish the stocks. Particularly for those samples which contain mixtures of genotypes it is usually argued that it is necessary for this multiplication to take place in ecological situations identical or very similar to the areas where the samples were originally collected, in order that the original genetic complement of the sample is ^{not} subjected to different selection pressures and therefore altered. The procedure is costly and involves a great deal of time and organisation by skilled staff. The seed stocks themselves are subject to the dangers of complete loss, mechanical mixing and possibly cross-pollination and genetic selection. It follows that the frequency of multiplication should be reduced to the minimum. Thus any extra costs of providing a really good storage system should be set against the costs, dangers and inconvenience of multiplication.
3. The size of seed samples to be stored. Most seeds show roughly the same weight/volume relationship (Fig. 1).

Fig. 1. Seed weight/volume relationships

<u>Species</u>	<u>16/ft³</u>	<u>Kg/1000 cc</u>	<u>vol.(cc) occupied by 1 kg.</u>
Lucerne	48.0	0.768	1,300
Wheat	48.0	0.768	1,300
Maize	44.8	0.718	1,390
Walnuts	40.0	0.641	1,560
Rice	36.0	0.577	1,733

The number of seeds per unit volume varies greatly between species and no doubt the volume of the sample to be stored should be determined by seed number rather than seed weight. Nevertheless, it would seem reasonable as a basis for the present discussion to assume that each sample for long-term storage should be of generous size (this would seem to be particularly desirable if infrequent multiplication is proposed), and that the average size of sample would be about 1 Kg. Thus, from Table 1, it would

*orthodox - behave quite predictably
recalcitrant - trees aquatic species
very sensitive to humidity
short term viability*

2.

follow that an ample average size sample would be about 2,000 cc.

4. Storage conditions for very long-term storage. In the case of species whose seeds show orthodox behaviour (i.e., most species except many of the aquatic plants and large-seed tree species), the available evidence indicates that seeds can be stored for very long periods if they are stored at a sufficiently low temperature and moisture content. Moisture contents can be safely dropped to 2% in most species and certainly to at least 5% (i.e., in equilibrium with about 10-15% air relative humidity in starchy seeds or about 25% in oily seeds). Thus there would certainly be no danger in storing orthodox seeds at moisture contents at 5% or in equilibrium with air at 25% R.H. (This is in agreement with the views of Harrington, 1972). So far as temperature is concerned, there does not seem to be any dangerous lower limit, even at values approaching absolute zero; and all the available evidence suggests that there would be a continual increase in viability period with decrease in temperature to very low values (Roberts, 1972). From these considerations it is concluded that orthodox seeds for genetic conservation should be stored at about 5% moisture content (or in equilibrium with air at about 25% R.H.) and at the lowest temperature which is economically feasible.

5. Economic factors determining the temperature of storage.

If it is recognised that, from the biological point of view, the lower the storage temperature the better, then the major factor determining the temperature to be used in practice is the capital cost of the store and associated refrigeration equipment necessary to maintain a given temperature. There is little difference in the cost of storage plant designed to maintain any temperature within the range -10°C . to -20°C .; but there would be an increased cost of about 15% if the plant were designed to maintain a temperature of -23°C .; for example. There would be little difference in the running costs of operating plant at say -10°C . or -20°C ., providing the store was not being entered very frequently. Consequently it is suggested that the main storage facility at Genetic Resources Centres should be run at -20°C . and that orthodox seeds should be stored at about 5°C . in moisture-proof containers at this temperature.

6. The cost of long-term storage facilities. The cost of storage facilities designed to operate at -20°C . is not very great but varies with the storage capacity required. The relationship between volume and cost is given approximately by the equation $\text{cost} = K \times \text{vol}^{2/3}$ (for cost in £ sterling and volume in cubic metres the value of K in U.K. is currently about 250 for "off-the-peg" units). Thus there is a worthwhile economy of scale.

In order to estimate roughly the cost of storing various numbers of samples, current prices of various sizes of "off-the-peg" low-temperature storage units have been taken. Fifteen percent has been added to the basic price in order to allow for provision of stand-by refrigeration equipment which, it is felt, should be standard for long-term seed storage facilities. If the units on which the estimates are based are surrounded by a brick structure it is estimated that their life should be greater than 100 years. The refrigeration equipment would need renewing every 12-25 years at about 20% of the current capital cost.

*trend shows
viability
containers
improving
below 0°C
optimally
should be
optimal to*

-273

The following assumptions have been made in estimating the

number of samples which can be held in a store of given volume.
 (a) The samples of seeds will be stored in cylindrical containers of 2000 cc average volume, and each cylinder will occupy a square-sectional prismatic space of 2,600 cc. (b) The containers will be placed on moveable shelving of the type found in library stacks so that in a rectangular store, the only working space that is necessary would be two passages 90 cm wide running at right-angles. Table 2 has been compiled incorporating these assumptions.

Commercially should not be any problem for -21°C

Table 2 (attached)

7. A comparison of current seed storage practice with that proposed here.

also significant differences in viability rates between -10 + 21

It is impossible to make comparisons between different practices of long-term seed conservation which are based on experience. There may be considerable errors in extrapolating what happens at very low temperatures and moisture contents from what happens at higher values and there may be a tendency to over-estimate the period of viability (Roberts, 1972, 1973), but it is the only method which is available. Nevertheless such estimates will give some indication of the order of magnitude of the multiplication intervals to be expected and the relative comparison between different storage systems is probably reasonably valid.

lower moisture content - better viability some species below 5% becomes deleterious

Table 3 shows the conditions employed in three seed-storage banks and compares them with the conditions proposed here in terms of the expected periods for viability of three common crop species to drop to 95%.

moisture content very stable in a sealed container

many species good down to 2% shouldn't really go below this level

Table 3. Expected multiplication intervals under various systems of storage.

<u>Organisation</u>	<u>Temperature</u>	<u>Moisture content</u>	<u>Estimate multiplication interval, years (time taken for viability to drop to 95%)</u>		
			<u>Triticum aestivum</u>	<u>Hordeum distichon</u>	<u>Vicia faba</u>
National Seed Storage Laboratory, Fort Collins, U. S. A.	4°C. **	32% R.H. (i.e., about 9% moisture content for non-oily seeds; about 4-6% for oily seeds)	8 9	95 109	17 20
Plant Genetics Resources Centre, Izmir, Turkey	0°C.	6% moisture cont. for cereals; 7-8% for oily seeds	27 30	540 710	90 90
National Seed Storage Laboratory, Hiratsuka, Japan.	-10°C. ***	4-6% moisture content	93 120	2,700 5,900	270 440
Conditions proposed here	-20°C.	5% moisture content	328 390	27,000 33,500	1,300 1,600

average with most long term storage x10

* Calculated from Seed Viability Nomographs (Roberts and Roberts, 1972).

** Three rooms are also available at -12°C.

*** Seed for distribution is held at -1°C.

Even allowing for large errors, from Table 3 it will be seen that for a number of common species, at least, problems connected with multiplication of seed stocks are likely to be minimal at a storage temperature of -20°C .

8. Recalcitrant species. No generalisation can be made yet about storage conditions appropriate for those seeds where the moisture content cannot be dropped below some relatively high critical value. It is suggested, therefore, that conditions for the storage of such recalcitrant seeds should not be specified at present and that immediate practical efforts should be concentrated on the conservation of orthodox species by seed storage.

9. Conclusions. Plant Genetic Resources Centres should include major facilities for the storage of orthodox species at 5% moisture content and -20°C . Such facilities should be designed to store samples which have a mean size of about 1kg. A routine programme of tests will be necessary to ensure that the samples are maintaining viability satisfactorily. For most species such tests probably need not be more frequent than, say every 20 years or so; though initially tests every five years may be necessary to inspire confidence. In order to maintain genetic integrity, the aim should be to keep viability above 90%.

At present it is not possible to recommend any generally suitable conditions for the storage of recalcitrant seeds which cannot be dried.

References

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- Roberts, E.H. (1972). Storage environment and the control of viability. In E.H. Roberts (ed.) Viability of Seeds, 14-58. Chapman & Hall, London.
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*recalcitrant seeds
should be precipitated
when the seeds drop
5% below the initial
viability state*

Recommended Conditions for Seed Storage
at Genetic Resources Centres.

E.H. Robe

Table 2. The capital cost of storing various numbers of seed samples at -20°C.

Capacity of "off-the-peg" storage unit		Basic cost in U.K. *		15% addition to basic cost for stand-by refrig. unit.		Useful storage space		No. of 1 Kg samples	Capital per samp
ft ³	m ³	£	\$	£	\$	m ³	% of total space		£
3,000	85	5,200	11,960	5,980	13,750	60	70	22,800	0.26
4,000	113	6,000	13,800	6,900	15,870	84	74	31,900	0.22
6,500	183	8,000	18,400	9,200	21,160	148	80	56,200	0.16
10,000	282	10,400	23,920	11,960	27,500	240	85	91,200	0.13

* At December 1973 prices and exchange rates (£1.00 = \$2.30 U.S.)

Proposed Standards for seed installations
used for long-term conservation of
'Base Collections'

- (1) Standard germination tests and moisture determinations, where possible using procedures identical with or similar to those prescribed by the International Seed Testing Association (Proc. Int. Seed Test Ass., 31, 1966), should be carried out on all samples received for inclusion in base collections.
- (2) Providing the viability is 80% or greater, the whole sample will be accepted for storage. If the viability is less than 80%, unless there are special circumstances (e.g., it is difficult or impossible to obtain samples showing greater viability), a proportion of the sample should be sent for multiplication to a centre concerned with active collections, so that the original sample can be replaced by y one in better condition.
- (3) The aim should be to store seed at $5 \pm 1\%$ moisture content (wet weight basis). If the sample received is greater than this, it should be dried by a method which is unlikely to affect viability; either of the following methods would be suitable: (a) Forced ventilation with warmed air not exceeding 40°C . (or initially 30°C . if the moisture content exceeds 18%); (b) equilibrating the seeds on trays at room temperature in a relative humidity controlled at t approximately 25% R.H.
- (4) When seeds are sufficiently dry (i.e., $5 \pm 1\%$), they should be stored in sealed containers in rooms or cabinets held at a temperature of -18°C . or less.
- (5) Arrangements should be made to maintain such a temperature, or return it rapidly, should there be a power failure or a breakdown in the refrigeration equipment. It is therefore recommended that refrigeration plant should be duplicated and that a stand-by alternative power source should be provided.
- (6) Arrangements should be made to carry out germination tests on sub-samples of 400 seeds on each acquisition at suitable intervals - say five years; though this period may ultimately be extended, at least for some species, in the light of experience.
- (7) When such tests show that viability has dropped 5% below the initial value on acquisition, arrangements should be made to send a proportion of the seeds for multiplication to a centre where active collections are maintained. The remainder of the sample will be kept, however, until the replacement seed has been received from the 'active centre'.
- (8) Full records will be kept of each acquisition.

DAVE:

1) I'm having a hard morning - pardon please.

2) Before we can completely work out the text of ALBANI's address we must consider the following:

- When will it be given in the context of the Agenda?

see item 8 6 June Am

- What is the object of his address -?

We should get this very clear among us. - is it a policy statement, or a cautious assessment? - ~~should be rely on that~~

- What is the tone he wants to take.

strong but not pushy

forceful

positive and suggests?

- What does he promise to do - ~~or~~
work program?

- what will he point to that he must produce

→ demon

→ proposal

~~It's~~
It's

What length and what detail.

be short and very much to the point.

As

- category expressions or terms?

We know we will also have to produce:

- a demonstration
- a paper from which the demonstration is made
- a short proposal based on ~~the~~ our presentation to ALBAUT.

Before outline for our ~~pr~~ seminar/paper
- ~~object~~

I.

object
Tone
length

II. Suggested outline.

~~The gets Beginning with the manuscript/Beaus~~
~~TAXIA work~~
~~what ~~is~~ are the questions &~~
~~who will ask them~~

I have some ideas - sort of
how we started

what we did and how
this has drawn us deeper
into the problem

our suggestions for discussing and

↳ ~~to~~ very heavy on what we have done
what will be done in the next

UNIVERSITY OF COLORADO

BOULDER, COLORADO 80302

DEPARTMENT OF BIOLOGY

FEB 1 1974

Dear Dave,

These look important, maybe a settlement check to get you back.

Nothing is too new here. The work on the USAID contract is going well and we get a good report off to Rice. This we will send you in a day or so.

We've sent off a cable to Olson which asks his involvement in setting up the April meeting here.

Gil White and Kenneth Boulding send their regards. They are up to all kinds of skulduggery.

John, Richard and all are fine.

Hobart is fine and sends his best.

Jim is doing very well and is plugging away. There is a bad bug in TAXIR which occurs when large banks are queried. It seems to be an counting array- it is possible that Brill placed a dibik on purpose in the system. It is hard to find, but conceptually easy to correct. It should not be a problem.

Nothing else much new here. Pedro had a meeting with his committee which torpedoed much of his work to date and suggested he not do a thesis but a plan II. It is, upon careful analysis a good idea, but it upset him very much. Yan asked me to work it out with him to see the wisdom. This I did and he seems to be okay. I think he'll have some good results. He misses you.

Otherwise, the world is bright and things seem to be going well.

Don work too hard.

Look forward to seeing you soon.

Gil

UNIVERSITY OF COLORADO

BOULDER, COLORADO 80302

DEPARTMENT OF BIOLOGY

February 6, 1978

debra Dave,

In addition to my hand written masterpiece of last night, enclosed, I should add the following:

- 1) the USAID project goes well, we have the report for Harold and are planning the conference for sometime in April.

We finally spoke to Bart Burkhalter and Fasasi Amim, who sounds very good, and we will probably work with them in some way. I've been trying to get Harold but we've been missing each other probably today.

- 2) Zea will be mailed tomorrow. A copy will be sent to you - for show and tell.
- 3) the enclosed letter arrived today. Do you want me to send something to these Canadians- if so what?

How is ~~it~~ it going at FAO. How are the consultancies coming, especially for Jim?

Be well and let me know what is happening-

Gil

oh. I have found a good New York company for all types of labels and forms. Do you want me to write to them?

Summary of uncommitted grant/contract funds¹, Taximetrics Lab.
as of 2/1/74.

1708-35	uncommitted	\$1,500.00
1708-37	uncommitted	\$1,495.00 ²
1708-48		\$ 00.00 ³
1708-55		\$ 00.00 ³
1708-60	uncommitted	(29.00)
1708-63	uncommitted	\$5,525.72

EMH:ls 2/8/74

¹Uncommitted funds remaining in an account after all current expenses and all committed future expenses are deducted. It represents the "flexible" money.

²This assumes payment to Hanley as agreed through June, 1974. Should be picked up on the FAO consultancy, then from 3000 to 5000 will enter this category.

³Account officially closed.

1708-35 Account Balance as of 2/1/74.

12/31/74 Balance from Director's Report	\$20,500.00
Expensed but not on report	
In-expenses	\$ 240.00
Paid Out	\$ 320.00
Purchase Order	\$ 2,100.00
Purchase Order (refunds)	\$ 400.00
Travel Expense	\$ 1,890.00
Expense Voucher (paid)	\$ 6,350.00
Expense Voucher (committed, not paid)	\$ 8,500.00
Other	
Uncommitted Reserve	\$ 1,500.00
Balance	\$21,150.00

1708-63

11/30/73 Balance	\$ 6,384.59
Expenses	
Telephone	\$ 58.87
Biology Department	\$ 800.00
Uncommitted Reserve	\$ 5,525.72
Balance	\$ 6,384.59

1708-37

12/31/73 Balance	\$ 7,285.92
Expenses	
Teletype	\$ 360.00
Telephone	\$ 30.00
Hanley (unpaid)	\$ 5,400.00
Uncommitted Reserve	\$ 1,495.92
Balance	\$ 7,285.92

1708-60

12/31/73 Balance	\$ 4,970.30
Expense	
Committment	\$ 5,000.00
? → J02534	\$ (29.70)
Balance	\$ 5,000.00

UNIVERSITY OF COLORADO
BOULDER, COLORADO 80302

DEPARTMENT OF BIOLOGY

February 8, 1974

Dear Dave,

The consultancy forms arrived today. We will complete them and get them back to you ASAP.

Professor Dr. Shushan asked if he could borrow an unused bookcase. I thought that it would be worth the loan in view of his bitching that it wasn't being used and we were keeping him from doing his work etc. He will write a receipt acknowledging that it's yours and he'll give it back.

We spoke to Harold yesterday. Man, according to him they're very excited about the work we've been doing and Marty Foreman wants us to continue working for him. There are other repercussions and HR wants a song and dance from us in March.

Nothing else worth mentioning- you're going to be in the faculty notes several times in the Silver and Gold and some people here really miss you. I'm glad to hear that.

More later- be well and love to Connie-

Gil
Gil

PS- oh yes- enclosed is our statement of accounts effective 2/1/74. I have prepared this from the director's reports and our files. They are accurate to * + 5%.

For a fast interperation, we are in very good condition. More on specific changes and possibility of other money later.

Your work on Harold about my dissertation went well. He wants me to continue to work for them, but really laid it on me about finishing my work. I will, old man.

Regards from Jay.

- Susan Semmon is "98%" finished. e'll check with Shipley today.

(1)

2/6/74

Dear Dave & Ronnie:

The Blustering winds bring snow and 6 degree weather while I imagine you are in mild and sunny sun. How nice!

Well, there is little news of interest here, at least in general. The University will still grind and I have no idea of the results. The department seems to be less because of your absence. Some I think really miss your lead - some others might be a bit relieved (Boshnell?).

Hobart has asked for assistance of minor sort twice - all done for him. His own has been very warm, cordial, friendly and helpful.

Pedro was delivered a curve ball by his committee and you I. has asked me to help Pedro make the most of it. Actually the curve ball will serve him better than his original plan. - or so he now believes. His work goes well but he does miss you.

(2)

That nit-wit Susan McMaster messed up more than you know. Man - she's a jerk. Susan Gammon has been found. She's "98% completed" with the mark and is meeting with the press people this week. I'll see that everything is worked out properly.

Curt Johnson is fine - and Jay and I have helped him through a redraft of the questionnaire. It's pretty good. There are some minor problems but we'll solve them. Curt mentioned the project to Jason Cione who advised him to speak to John Chaney who is now the Business VP (replacing Erskin).

Chaney is on the verge of ~~buying~~ ✓
buying a proprietary package called Mark II from a California group called Informatica Inc. Their brochure states that they have a System that will do everything or almost any Unix or IBM equipment. The internals of the system are not revealed - of course - but the Company will relieve the University

or any other customer in the academic community of \$32,000. (non-academic \$64,000.). The \$64,000 question is of internal decision - of course. Chaney is in a real bloop - he is a good man (according to usually reliable sources) who has been handed a real mess. He has 12 months to pull the University (or them) out from real trouble. He's under pressure and he wants fast results. Both Claude and Curt has made him aware of TAXIR. He is interested but wants to know ^② how fast we can perform for all his needs ^③ and how we would be in a cost / effectiveness comparison to Mark III or other systems. I imagine he is not pleased that neither Bartum (1969) nor Evstkin (1972) never followed up on our approaches to them. He is impressed on what Brill is doing in Michigan. The key problem will be how fast we can deliver a workable administrative system. we will meet with some of his staff next week and with Chaney on Feb 18. My god - what has Curt got us into!

- 4 -
position

I don't know the outcome but we'll be in a position which is good in either case. If we should be asked to place TAXIR in readiness to handle (or be tested to handle) some of CII's needs - then the funds will be made available to complete the work we want to do. The improvements to the system TAXIR will include all that we will ever need. Should Chaney not fund the improvements to TAXIR - then we will have a chance to examine some of the other systems he may choose to use or buy and to evaluate them with respect to TAXIR. We can set a comparison to see if we'd be better off with another system. I doubt this but we can test it at Chaney's cost.

Well, we'll see what happens. I'll write you more. If Chaney wants to spend some money for cooperation I'll call you for further instructions.

In the meantime, I've spoken at some length with Bob Shiffman of the Computing Center. He is beginning to realize what he's got. I think we can get some more support from them including some money for personnel.

I'm not clear on our future relations with them but Schiffman wants them cordial and he'll try to do what ~~is~~ is to our mutual benefit. We'll see about that too.

Now then, I spoke to Dean Savin. He made me aware of a well funded pot of money which was to be used for experimental computer development which might be useful to Kodins.

The money is handled by each college and is part of the computer centers donated budget. Now, Savin is in charge of the Arts and science budget. I was not aware of it has been used and it is very poorly advertised. Savin asked if we could use some - and then referred me to Russ Dohmen of the computer center. I called Cloude and told him of this. He did not know of the program but is obtaining permission from Dean Bausher to use some of the money for TAXIN development. Savin has also approved.

6

✓

Dohrman, who is very interested in TAXIR now, thinks that the following development plan has much merit. I'm meeting with him to see if we can work out the costs of a program. (The funds will include programmer time as well as computer costs). ~~I think we will~~

1) work out ~~out~~ at ~~up~~ a data input module which will permit the format conversion of data from any form or order to TAXIR format

2) to allow for subset retrieval - and then with a few control cards place these data subsets into any number of packages.

3) output from TAXIR or any module any type of report (map, graph) etc. This is ~~like~~ like the ENVIR system - and somewhat beyond.

It would be ideal for teaching - and very useful for what we will need. Well - I'll

let you know if this can be made to happen.

Hell - all hell's breaking loose here. I wish you were back here. I think if FAO won't meet what you want, you should come back!

There's more. Jay's doing very well - and Claude is beating the commercial bush. He includes you in it if something works. Jack Lucas is the president of DART - by the way.

well, I'm sleepy now -

Let me hear soon what's happening there.

See well -

Bill

Taximetrics

Dear Dave,

I'll try a several dates approach and see what I can recall at the end of each day should there be anything of note.

2/11/74: The weather is balmy and wonderful and will last so for the rest of the week. AM meeting with Russel Dohrman of the computer center. He's some type of assistant director. The meeting concerned what I found out from Dean Savin- that there was (is) since last July a experimental course development fund which was to be jointly administered by the CC and the various schools (colleges) on campus. I understand it was from \$100 to \$200,000! Virtually nothing has been done with the money with the exception of the engineers. I guess this is what old Kruger was talking about when he mentioned some sort of project with the other schools- and what we could do to help them. Anyway I talked to Dohrman about the continued development of EXIR and how it could be used by the schools for teaching and research. He is interested and said that we should work out a proposal with the CC and then have the deans submit it to the CC. This is ok with Dean Savin and Dean Baum. It may come to pass that we can get a \$30,000. budget to work on EXIR here at no cost to us. This may also include the maintenance of all the taximetrics systems and their being placed in the library.

Time will tell but it is clear that some of the things you may have wanted to do will be done.

The teletype terminal is getting some more use. We found a way to use it as a keypunch and the students are delighted. So are some of the other non-taximetrics students and I have a hunch that it might become more popular to use the computer in this department than before.

The Zea project will be out by Monday. Jim will have complete the RESEQUENCE DESCRIPTORS command by that time and we will be able to do more than ever before. He is about 70% finished with the documentation and has cleaned up about 50% of the original TAXIR bugs. The CC has agreed to correct the Klapakeh bugs and will do so shortly.

We are trying some new things with the ZEA which should really assist us when we have to use the general maintenance system in Rome. If it works I'll point it out in some detail with the copy of the ZEA I send off to you.

Peggy Shipley was over here today and went over the book with Susan Gammon. She has some questions which they will formulate and I will call Appan to see if he can answer them. If not I'll call you. They want to move with the book before prices become even higher than they are now.

Your friend Sam Sushan has asked to borrow a bookcase and has written a receipt for it., A copy of the receipt is in the files and another is with Liz Owen. I wouldn't trust these folks here as far as I could.....

Jay is working well, and he has carried the brunt of the model development and today we begin to wrap up our report to the AID people. Harold wants a song and dance for the first week in March. He is really interested. I will try to have a planning grant on the manifold then too, although Appan has not sent his draft yet. I expect that he will do so some time today.

There is a post-doc here who is interested in the tropics. I forgot his name but he is known to you and Yan. How about using him as a cheapo post doc if appan should not be able to actually be sprung loose during the planning grant period?

Well- let me know what you think on this. I'll get a draft off to you as soon as I have the basic material from Appan.

MAXIMETRICS LABORATORY
DEPARTMENT OF BIOLOGY
UNIVERSITY OF COLORADO
BOULDER, COLORADO 80302
HALE 114. (303) 443-2211 X 8398



FEB 12 1974

Dr. David J. Rogers
Crops Ecology and Genetics Resources
FAO
Via Delle Terme di Caracalla
00100- ROME

ITALY

AEROGGRAMME • VIA AIR MAIL • PAR AVION

② Second fold

am also putting together the formal draft of the EXIR development schedule and testing procedure and we have discussed it. This can be considered to be Appendix three to our paper and part of the operational plan for Rome. I will send a draft for your alterations by Monday next.

We will be able to get some time on the IBM 379 here which seems to be similar to the system in Rome (except the Drums). I think we may be able to see that Jim gets some pre training in the system- and probably start the conversion to ANSI standards on the IBM machine. More on this later.

Please send any instructions you want me to know. I am going along with the policy of keeping everything possible in front of your colleagues as if you were not gone.

Come to console

gil

Additional message area

*PS - several late approach letters +
work - too much news.*

What's new there?

gil

2/14/74

Dear Dave and Connie -

a letter a day - more than for my
dad!

Just a note to inform you that
Curt Johnson's father died last week.
Just thought you might want to
know.

all else is well. Dear Sam
sends his regards.

Hobart is borrowing a filing
cabinet that we had in 108.

Nothing else new -

Gil

22 February 1974

To: David J. Rogers

From: Gil Hersh *GH*

RE: Fund Balance Report, Taximetrics Laboratory as of 2/22/74

Copy to Dr. Smith

1708-35

1.	expended but not reported	\$4,900.
2.	transfer from other account	850.
3.	travel refund due	(250.)
4.	consultancy encumbered	5,000.
5.	un-commited balance	1,010.
6.	cash balance directors report	(11,510.)
7.	overdrawn	-0-

1708-37

1.	expended but not reported	1,160.
2.	consultancy encumbered	4,260.
3.	equip encumbered	300.
4.	uncommitted balance	1,355.
5.	cash balance/directors report	(7,075.)
6.	overdrawn	-0-

1708-63

committed to press	5,000.
cash balance	(5,000.)

1708-63

committed or expensed	-0-
cash balance	(5,215.)
uncommitted funds	5,215.

summary: there are \$7,580. in uncommitted (useable) funds. Requests have been sent to Rice at his request to free the funds from 1708-63 for use and extension of the deadline for 1708-35.

Should the Hanley consultancy be available from FAO, then the uncommitted balance will be \$4,260. Hersh.

DAM -

good to speak with you today.

As you see we're ok for
the money. - so far

as soon as we have the
consultancy for Jim - we
can free up some cash.

Be well

Gil.

I've given Hobart a copy of this

since his visits. my former

Gil

3/5/74

Dear Dave-

The spring is beginning here and it is beautiful. The campus has turned to another madness- streaking- an article is enclosed which defines the sport and which lets you know what you are missing. It is rumored that the area in front of Hale will be a streaker field in the near future.

You'll be sorry you left.

Kruger has agreed to let us direct the use of some of the experimental tracing/course money for the development of a complete EXIR system for on campus use. Needless to say once the code is complete it will be transportable. In fact the project person for the computing center, Reseale Dohrman (my counterpart) agrees that all should be done in ANSIII standard Fortran.

Sawin here has agreed to let us coordinate the project.

Meanwhile, the work is being cranked out by Jim. He has added several other useful features and is continuing with the documentation. The next step- that of modularization would begin shortly.

We await with bated breath the wisdom from PAO. Both Jim and I are more than interested for some type of answer from Rome. I have a major addendum coming out on the project ZEA which will have some cost simulations, and some means of studying standards- etc using the EXIR system. This will be of great use to us- should we continue to work on this- in the very near future.

As far as the degree is concerned- Claude and others agree that there is a good dissertation topic ~~flit~~ flirting through what I have been doing on the use and administrative and ~~scietific~~ scientific aspects of information systems and their development. I wish to get this done because of the work already invested.

Claude also has fished up an NSF proposal for information systems in the urban areas- it is from RAIN and is exactly what we proposed to Crowe for the city of Boulder several years ago (by the way- this course development project is a modern rerun of what we proposed to Crowe several years ago).

We will submit the project because 1) it might provide ~~some~~ funds to continue what is already being done, 2) I wish to have some income for 1974 if the Rome thing does not come through. I will keep you informed on this,

The CU administrators we have spoken to about EXIR and administration are excellent men who want to see it work and are willing to allow us as much IBM 370 145 time as we need at no cost. We might be able to begin concersion to IBM soon. ~~mhhdadedjdgghndedgqndndndndnd~~

Please jag the fwlls in Rome so we can begin to get paid for the work we are already doing for them.

What else is new- we all miss you. Be well and write something on occasion.

Campus engulfed in streaker madness

By DEBBIE TASSIE
Daily Staff

The two young men who walked into the Daily office at noon looked like anybody else who wanted to place a classified ad.

But they asked for a reporter. "We're the streakers," they said. The streakers? They were supposed to be in the Fountain Area at noon. The Daily was there, a reporter and a photo-

ditorium, the real streakers said the location has been changed to the dormitories. This will be a test-run, they said. If it's successful, they will organize for a more conspicuous place.

The real streakers had Eiped Thursday's streak would be the first to include women but Monday night a woman at Westchester State College in Pennsylvania led a group of 90 streakers from dorm to dorm, ac-

off from points around the campus.

With a goal of 500 in mind, the streakers are encouraging everyone to join them, especially women. Although they said they don't mind if the women streak through men's dorms, they are asking men not to streak through women's dorms. They don't want to offend anyone's sensibilities.

The only requirements for streakers is that they wear "tennis shoes and a smile," they said.

Boulder's KADE radio has promised national coverage of the University's next streak — live, if possible.

The real streakers said the man who was busted Monday night outside of Kittredge is an amateur. They said they expect the man's arrest to draw more people to the streaking movement.

However, University police relations officer Frank Albi hopes the arrest will discourage streakers. He said both United Press International and Associated Press called him Tuesday to ask about the busted streaker. Albi told them he didn't want to release the streaker's name, but AP insisted. "Open records laws dictate that a person's name must be given to the press if they insist," he said, and he had to tell them.

The streaker, 19-year-old Thomas Wilson, has been charged with indecent exposure. Bill Fritzel of the district attorney's office said he is trying to arrange for deferred prosecution for Wilson, who will be arraigned March 25.

"If you have second thoughts

about your family hearing of this, you better not streak," Albi said.

The University Police will attend Thursday night's streak. "We'll probably follow standard procedures, the way we do at all other demonstrations. We'll try to direct traffic for them and do our best to organize things and make sure they don't get run over.

"You might advise women

who said he attended the event said a group of about 20 people were standing around the pond near Kittredge deciding whether or not to streak. The University police were also there, he said.

Officer Mike Watson walked over to the group, according to the caller. When they told him they wanted to streak, he said it wouldn't offend him, the caller said. Then someone yelled that it was o.k., and the streakers took off.

Bennett "jumped out of nowhere," said the caller, tackled Wilson, threw him to the ground, threw his coat over him and handcuffed him. He wouldn't let Wilson put his clothes on before he took him to the police station.

The caller said Bennett implied he wanted to make an example of Wilson to discourage streaking.

Bennett could not be reached for comment and Watson said he couldn't say anything.

SUC is apparently not the only campus streaking organization. Tuesday the Daily received a letter from the American Streaker Society — ASS — describing the Monday night streak and complaining about the streaker's arrest. ASS ended their letter "Be ready for the Super Streak."

A third streaker group is more militant. "Spring is in the air and we are bare," is their motto, according to a man who dropped into the office Tuesday afternoon. The police won't know where their next streak will occur, he said.

Is this a game with the police? "Yes," he said.

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Flash

"Out of the dorms into the streets," was the rallying cry for approximately 800 dormitory residents who watched about 50 streakers flash through the cool Tuesday night.

About 350 gathered around the Kittredge ponds to watch 50 nude men and women race around the lakes. Another 350 students patrolled outside Farrand, Nichols and Hallett halls in hopes of getting flashes of the streakers. Another 250 students gathered on the North side of the Business Building.

All campus police units patrolled the crowds, but no arrests were made at Daily presstime.

At Kittredge, the crowds were urged to strip, "because if you don't, it means you support Nixon."

"What's to life if you can't bare your ass," said one of the Kittredge streakers.

grapher from the Daily Camera were there, and one or two University cops walked through inconspicuously in those nice blue blazers they wear.

But no streakers streaked.

These two streakers said they hadn't made any calls about a noon streak-in. They also said they were the "real" streakers and were organizing the World's Largest Streak for this Thursday night at 9:30 p.m. Their organization is called Streakers of the University of Colorado — SUC.

Although the streak was originally called for Macky Au-

cording to the Associated Press.

Approximately 100 men and women streaked through the streets at Memphis State University Monday night. Police watched, but made no attempts to arrest anyone. One officer said he could have caught several people, "but I just don't like the thought of wrestling with a naked man."

Thursday's streak will be triggered by announcements on KLZ-FM and KBPL. The word will be "the movement is afoot," a streaker slogan. When the word is heard, streakers will take



that it wouldn't hurt to wear their whistles. They probably wouldn't worry about getting arrested, but might have to deal with on-the-spot interviews.

"I hope it doesn't blow or snow too hard," Albi concluded.

Although Wilson has a good chance of getting deferred prosecution, a number of University students are angry over the way Officer Bob Bennett handled the situation. An anonymous caller

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streakers. . .

continued from page 1

The SUC streakers said they have already streaked three times without being caught. They are encouraging the spread of the movement to up the University's school spirit and rating as the number one party school. The streak Monday night was the first official streak in the state, they said.

A streak reported recently at Colorado State University cannot be counted as official because the streaker was, of all

things, wearing pants. "We consider CSU amateurs and rookies," said the SUC streakers with disdain. "They haven't got any guts."

A streak at the University of North Carolina is said to have drawn as many as 250 people, and a streak at the University of South Carolina, 400.

Streaking is not limited to either long or short hairs, said the SUC streakers. While they are members of ROTC, and fall into the short-hair class, they said at least three-quarters of their group is long-haired. The seat of streakdom is Brackett Hall, where the ROTCs on the

second floor have gotten together with the freaks of the first floor.

While the streakers speculated on streaking as a way to raise funds for charitable organizations (Streak for Cancer, Streak for Day Care) and said they may eventually seek ASUC approval, they said streaking has little social significance.

The custom apparently originated at the U.S. Naval Academy at Annapolis. They said their ROTC instructors have told them that cadets at Annapolis honor a long-time custom where anyone who manages to streak to a certain point and back three times



One of the men was charged with indecent exposure and the other with disorderly conduct and resisting arrest.

The chancellor of the University of Tennessee at Knoxville said streaking Monday night resulted in interference with traffic, property damage and personal injury.

What does a streaker look like? Well, the two SUC streakers are mild-mannered and clean-cut, both about medium height. One of them has brown hair and wore a road-runner t-shirt. He looked like Ronnie Howard in *American Graffiti*. The other was dark, and though short-haired, had succumbed to the hippie influence of the past few

will be excused from sitting at attention during meals.

But the surge of streaking on campuses doesn't represent any influx of military influence, they said. "We're just doing it to see what the society is going to think."

Would they like to encourage nudity? "No. How could you have more nudity than you've got now?" they said.



March 12

Dear Dave-

Thanks for your letter of 26 Feb. It arrived ~~haha~~ last week but I haven't had a chance to answer it. I am working hard on the USAID report and several other things- right now I must admit I'm hassled but a bit bored. I miss your usual good advice.

Today the Civil Service Commission sent one of their boys to see me. He is doing a full field investigation of you. It has taken this long to get going on your clearance. The fellow was thorough about you ~~he~~ and has been asking around concerning a number of matters. He wanted to know if I though you were "abrasive" or had any bad habits or drank too much etc. He assured me that these were standard questions. He had also unearthed the anti-defamation thing. I hope I was able to put that to rest.

Well, if working for some international agency requies all that hassle- maybe its not worth it. From what you have said in your letter the opportuinites may be there but I wonder if it is worth it at all.

I'll not speculate furhterp- but one must be as clean as a hounds tooth fo sit and do precious little for their keep- but some of the worst crooks this century sit in or near the White House.

Never mind, I think I need a few days off.

Working on the Zea uncovered a whole mess of bugs in the program- most of which were Klapakhe and some even Brill. They were gloss overs. Jim had a share of them but was fast to correct them. The others took more time and he has been pulling the hair from his head.

He is a good man by the way. I wrote a request for a check for him in the amount of \$1,140. and the university sent him one for \$11,140. Not a bad month's pay.

Not much is new here since the last letter. People are getting ready for spring and so am I. Hope to see yo asap. Be well and don't fret- maybe a vacation in rome is a good thing#.

Be well-

G:l



UNIVERSITY OF COLORADO

BOULDER, COLORADO 80302

DEPARTMENT OF BIOLOGY

April 11, 1974

Dear Dave and Connie,

It was good to speak to you last week although a bit frustrating. I can imagine what it must be like at FAO. I am sorry that I am not there with you to discuss and plan- it seems to be a cup of tea for me and a real drag for you.

In this letter I will try to cover a few points. I will report on the Washington trip and what is germane to the work on genetic resources and what some of the people there want us to do. I will then report on conversations with USDA, then with Bob Bird of Cimmyt, then of things happening with respect to the computing center and last a report on subdry items including things at the biology department, DARI, and campus in general. The second part will be some ramblings on strategy that we may wish to follow or not as you see fit. I will incorporate some comments on work which we might do while at FAO and some lists and such you can gather now (if you don't have them already).

1. The trip to Washington can be divided into two parts:
USAID and USDA.

In USAID we saw the following people and discussed various things with each:

(Harold Rice, Marty Foreman) (Irwin Hornstein and Robert Kahn) (Russell Olson) with these folks we discussed our project in Nigeria. They were pleased with what we have done to date and Foreman wants us to continue, and after a rather harrowing experience at lunch with him on the second day we were there, he concluded that we would be the best team to continue the project. He wants us to conduct a seminar/workshop conference in Nigeria for Nigerian decision makers on our findings. He expects that the Nigerians will then determine a course of action concerning a possible intervention plan that we can then help them plan and execute. This would be done in conjunction with the USAID mission in Nigeria (Olson). They are interested in the project and wish to assist us and possibly use us as consultants in further work that is related. (As you know they have the result of a very major study made by two consortia of Land Grant Universities from the US on how to increase the Nigerian Food Supply. One of the aspects of this work is the increased production of cassava and work to improve it (whatever that means). The report of the Consortia is long and has been very expensive. Olson, who is an Iowa State Ag. Economist, is impressed with the scope of the study but is sure that there is no transmission vehicle for getting from pretty theory into real results. He is clever enough to know that it is not merely an "extension" problem. He wishes to use the Foreman generated workshop conference on cassava as a test case to see if it works and if we can prepare it in such a way as to come up with a workable program that then can be the transmission vehicle. He also believes that the work done by the Consortia does not cover the plain points of consumer needs nor what has been termed by Chuck as the distribution sector.

Olson likes our methods and our approach and is impressed with me and Jay (and works with you and knows of Chuck) and wants us to put on the Cassava show. If it works well he may ask us to put on shows for the other crops using the same integrated methods. He is interested in our training personnel who then can continue to monitor and understand the work. He is ~~not~~ ^{not} back in Nigeria and he will plan the conference from that end. He expects to use IITA as a host institution. Foreman will provide the necessary and sufficient funds to pay us ~~and cover our costs~~ and cover our costs for the conference.

Foreman is now our friend- as Harold suggests- he is pleased with our work and wants us to be stringers for him. If we do well with the Conference Harold thinks Foreman will keep us in work if we want it. It is even remotely possible that we may get a 211D contract for improving the CU's capacity to do this work for USAID. But this is a long way off at the moment.

Harstein hinted at the possibility that USAID might want Jay and I to work for them. I'm under the impression that this would be on a contractual basis ~~as~~ as I've suggested above. This would not exclude you or ~~me~~ ^{us} Chuck but they understand that we are not faculty here.

(Litzenberger and some of the people in the AG shop)

The people in the agriculture shop who attended our working session were impressed and interested in our work. You would have been amazed at the number of ag types who oohed and aahed at ~~the~~ what we said and all of who suggested that they always knew that something should be done about cassava, etc. Even Sam was a little bit "I know it all along" although he admitted that they have always given short shrift to cassava.

The ag people are interested in pursuing the work on cassava although it has become somewhat clear that cassava is not in their portfolio- it belongs to Nestel. Sam, however, wants badly to do the collection of the wild species as we have suggested- although he is not clear how this best should be funded and handled from the USAID's standpoint. He suggested that we should take out a \$25k grant not only for planning ~~work~~ but for some initial collection especially of those species which ~~we~~ might lead to 1) drought resistance due to the tremendous problem in the Sahelian region of Africa and those which will assist in 2) protein increase, 3) resistance to various pests. I told Sam about your doubts in #2 but he said he still wanted this tested fully.

He also stated that he did not like what he perceived as the Nestel strategy (CIAT'S) on use of cassava as an animal food or an export crop only. He is sure that there is a place for this but it is not in Africa. He wants us to continue using our methods to do a classification of use areas to make sure that the end use strategy and the breeding programs match the defined needs. He has heard our argument and agrees. He is a firm friend. He also told us that it is necessary to make these ~~to~~ to Erwin Long who has an interest and who will make the decisions. (I will go into this in a minute- in fact Sam was so infatigable about us seeing Long he almost shook. I told him how hard it was to get an appointment with Long- and he said "...go sit on his doorstep..." Curt was along and was listening to these conversations.) Oh yes, for the larger collection project Sam said he would help us apply for a \$406 grant which he has some say in and which is jointly funded by USDA. It is for developing tropical competence and things we should have one for the collection evaluation and preservation of the wild species. This can be done for the year 1976-77 for July and would be timely he thinks.

He also said that someone should begin to look at the egusi (the seeds from citrullus vulgaris which are used in making the soup. These are a major source of proteint and no one knows much about them - we pointed out their importance.

We also discussed the following with sam:

The problems of genetic resources information systems and in general ~~genetic-resource~~ information for agriculture. He told us that he did not realize what our work wast with Taxir/exir and did not really know of our considerable interest and investment in this area. He said that he has pushed for a long time for there to be a standard system which could be used by all the people involved in genetic resources (he ~~wrote~~ listed off a number of people in ~~thes-~~ this country- I have the list). He also suggested that Quentin Jones would be very interested as well and we should speak to him at once.

He also said that Hawaii had just been given a 40% of \$500k to develop an information system and felt that we had been missed- just as we had been missed in the Georgia case- and he was frustrated. He told us who to contact so we would not reinvent the wheel. He suggested that he would do everything he could to get us some assistance in this area although he had no funds he might assit in getting some sub contracts.

He then ~~turned-a-~~ turned around and suggested that he might be able to get us some invitational travel money from USAID and some travel consulting time to ~~visit~~ visit all the places that have Infor Sytems needs and to speak to them and so some demonstrating. I am sending him a copy ~~summary~~ of the ZEA project. He liked pp our paper and agreed with our general approach. We will have very much more to say to sam.

It is also been suggested by Harold that Sam has a very ~~def~~ definite interes in the area called research application which takes the product post farm and moves it toward the consumer. It is the entire range from productio to final nutrition and agrees that it should be done jointly with the ~~new~~ nutrition shop. (in fact the relations ~~wha~~ between ag and nutrition are more than excellent now). It is possible that Harold will land in this job and it may be that he will be valling on us to do ~~some~~ furhter work under the ag banner.)

Bob Simpson-

Bob is the key man (if not the chief) of the Latin American planning bureau. He is not a TAB person anymore ~~but~~ a program officer-meaning that he has his hands on those who have their hands on money. Harold describes it like this. The program officers in the missions in Latin America draw up the programs that are needed for their areas, and then they present these progrsms to Bob's team for scurtiny, criticism and approval. Bob has a lot of impact in suggesting programs and suggesting their changes if he sthinks this should be done. He is very interested in ~~nutritio~~ nutrition type prgrams and greatly believes in our work to date. He thinks there will be work for us ~~in~~ in Latin America if we want it. In fact he is pushing hard a prgoram for Haiti and wanted to know if we could do the same thing there as we did ~~n-~~ in Nigeria. He also suggested that we get to see Long concerning all of our cass-va observations and those which affect CIAT/IITA/Canadians and the USAID.

Rogers 4

Simpson is a good man and he feels we've done a good job for USAID.

We saw a ~~ex~~ fellow who is somewhat ^{Kenneth Shepper} a counterpart to Bob in the Africa missions area- he ~~is~~ works for Princeton Lyman who we met before. He ~~is-also-mightily-interested-in-these-problems-and-is-willing-to-assi~~ was also interested in our work. We tried to convince him of our desire to train some africans in the methods ~~ap~~ they could use it in other areas. He wants us to go and work in Zaire again-although he has no direct control over the mission. He told me that David and Neptune are leaving. He then introduced me to the new man who will be the p ogram officer there. (He was not very bright- I fear and was more interested in what food they had that he could buy for his own use since he was a vergitarian, then he was in the problems of USAID- this was confirmed in a later meeting with Erwin Long).

Erwin Long-

At first Long was busy preparing for Senate hearings- then he was busy preparing for some trip that he would have to make and told us that he could not see us although he was interested. Old Curt pulled out his Dean's title and he got us 30 minuted with Long and then some of the trips were ~~cancellee-~~ cancelled and some of the hearings ended and he aspent the better part of two hours with us.

He remembers you fondly as the leading expert on ~~ess~~ cassava in the w ild, etc.

He was very interestd in our work and probably wishes to see it continue. He is sure that Foreman, Litzenberger and Simpson will find ample work for us/ this meaning that he w~~o~~uld have noting of an institutional nature for us/ but then we disuswed the collection ~~m~~ of the germ plasm and ~~s~~ me of the political complexity involved. I mentioned that Sam wanted it done and the problem was how to do it and integrate all the political persons and institutions involved. He said that it should be done and done right and that we should submit a memo to litzenberger which would come to him. The memo should included a total plan with the proper briefing on the politics- he asid not to worry about the money amounts- just the memo. He would then get together with Sam and others (Guy Baird who is interested' in the interrelations of the agencies like ~~6*-~~ CIAT- etc.) and would determine what ~~WADDS-~~ USAID's role sh~~o~~uld be and how it would then procede. Long is very sensitive about stepping on the canadian's toes. He wants this soon and I had a copy of a plan ready- but did not present it because it was no t constructed as he wanted it. He'll have it by week's end.

We then discussed the entire problems of cassava strat and coordination. He was concerned that a good systems ~~per~~ approach ~~w~~ may not have been used to set ~~up~~ proper priorities and ~~coordination~~ coordination- and that he is interested in this being done as soon as possible. He asked us for a cassava strat. memo which he ~~we~~ could use as a talking document to see what USAID's role might be if any and to see if we might be the external agency that can assist as analysts in putting toether this strat. (no dissimilar to what you did at first for the Rockefeller peoople). We can provide him with this and then see what happens. He was very cordial and very interested in what we have done- and has a good idea of what we may want to do. He may decide to do so-ething with us and he may decide not to. It is up in the air but we must reppond- at least the collection is in your perview.

Overall, then the USAID protion was good and we have done some good work for them and they know it. Some of the people with money or who can influence money would like to employ us in several areas- but exactly how this will take place is unclear. We do have a continuation commitment from Berman so we will not run dry at once. The others would like to find the links to work with us and in time may do so,

It is necessary to follow up closely with Litzenger on the collection and the information systems that we have. This is promising and he will pay us for an excuse and when he has money. He is a good man and he is most cordial.

I went over to USDA to see SOOY. I demonstrated the system EXIR on data he sent to us (1500 records of guar, Cyamopsis tetragonoloba from Fort Collins). He was mighty satisfied with the demonstration as were a few others in his shop. He wanted us to meet the boss and we did. This fellow- a Ron something thanked us for helping Dick Sooy and for helping them. They didn't know how they were going to hack some of the info problems before we came along.

Sooy mentioned the following:

- 1) could we assist in some way to convert EXIR to the univac 1108 that has been installed for USDA at Fort Collins?
- 2) how might we continue working on the development of EXIR jointly given that there is some work to be done on it and the USDA should have the general system for its own purposes.

He- I asked him what would be the source of funds- he told me that in both cases it would be Quentin Jones. He said that the timer is straight forward and should be no problem. The later is outside of his purview and I should talk directly with Jones but Sooy was convinced that it should be EXIR and that we should be the team with whom USDA works.

Naturally I called Jones: Here is the following summary=

Jones was cordial to us and was interested in our well being. I did not mince words about some of the coordination difficulties with FAO and he was empathetic. He was sure that there was a solution somewhere. He was interested in our approach and could be interested in ~~turing-some-money-over-~~contracting with us to do some developmental work with EXIR and USDA if it could be available to all USDA personnel. He said that for the first time there was a request for funds to do such systems development and that if congress passed their bill it would be available this year. He said that the USDA computing shop (sooy) had the right of refusal in ~~using-the-~~using the funds but that if they wanted us they could buy us. He said that he would keep us posted and to stay in touch with him and that he would be amenable to a memo (in lieu of an actual proposal) to do this work for USDA.

I think this is hot and will continue working with Jones on it.

I spoke to him twice about the Hawaii contract. It turns out that the rant to Hawaii is not solely for an information retrieval system but to gather all that is known about a tropical agriculture into one center and then to computerize this. It has his feeling that we have a part in this with Hawaii- and to contact them and that they may be able to assist us as well.

I agree with him and will be in touch with a Ken Haynes at Hawaii/ as well as others who might be interested in the existence of the system. I will attempt to put together a preliminary ~~brief~~ briefing memo for both Litzenberger and Jones so they can see what we are doing and what we want to do at the same time. Both want copies of the ZEA run- and hopefully I will be able to get them copies of VIGNA as well./

OKay- no where are we,

Yes, I spoke to Robert Bird at CIMMYT. He told me that a group of experts from the GRC/TAC (two men) came through to see what the computer systems needs of the GRC was and these men will be calling at all of the international GRCs and then issue their report. He said that they were interested mostly in statistical needs and financial needs of the organizations and really did not know what they were doing. Further they asked the questions from the scientists and the sci-ists did not know how to respond (as we have said in our paper). The meetings lasted a few ~~day~~ days and these folks went off to the next center. It is imperative that we get to these analysts or to the TAC to discuss this type of research. It is further of great importance that we see that an overall systems strat as we have put ~~together~~ together is used by the TAC. Can't we get pincot to do some good on this? I really feel that we will have the ball slip between our fingers if the ~~people~~ proper moves are not made to the TAC? What do you think. Can you get the names of the TACs and we can ~~see~~ send them our paper with a short covering memo and maybe a sample of the zea work- and comments of what we have seen and how these problems may be handled (including your work at IZMIR). It is urgent that we get an ~~introduction~~ introduction point to the TAC and take over some of the strat. formation for them. I have several ideas waltzing around my mind as to what we might do with FAO and the TAC if we are spry on our feet. An analysis of the fears and needs of both groups is necessary to ~~propose~~ propose a plan that both can accept and which may permit us to be the contractors for both sets of needs. Of course I'm probably guessing at this ~~point~~ point and your on the spot sly u'll have to ~~see-us-k~~ determine what you think best.

I wish to offer the following to you though:

- 1) it is important to get what we want and to do the best job for the needs that we see. Our paper pointed to this clearly but it is not out yet, and there are already need to revise it give some more knowledge that we have.
- 2) we have done three pilot projects (S lanum, Zea and Guar) and will do one more Vigna (which is from Rachie at IITA=~~is~~ and is the only breeder oriented project). We can revise the paper and have salinet points of these ~~three~~ four ~~three~~ pilot projects put together to present in Rome. Copies of this work can also be sent to members of the TAC and members of the GRC group around the world. The memo will have to carefully written to assume that the material is read and understood. The demonstration and the paper will serve as appendicies. This can be put together here and when we get together. It can serve as the briefing document for the TAC and others. We can also use this as our final report to NSF and to CU. Further we can use it as the basis for a proposal of how to procede to the various agencies. If you agree let ~~me~~ hear from you on this very soon. I think it is important to use our remianing NSF funds to do this piece of work if necessary.

Rogers 7

We can use these funds because we will have met our commitment to Jim with the FAO consultancy you have arranged. If more work/contracts & consultancies are forthcoming then we continue- if not there is no use' having a few thousand in the fund if we could have used the money to further our purpose. Right now we have a fund balance of about \$4000.

I' somewhat weary now and wish to terminate this report for the time, I will ~~never~~ cover only one section which should be of interest:

the bio department and the dean (sawin) are interested in our proposed introduction to quantitative methods and the computer, and the computing center has turned on the yellow light to proceed with a proposal which Jay is compiling. It will be in their hands by 4/20. You may return to a project which you desired several years ago. The project will include the ~~development~~ development of EXIR to a point for use in research and teaching, the placing of that program in the computer library and the installation of graph and character in the library as well. If nothing else we go something established....

Hobart says and answer has gone off to you concerning you leave. I think that it is okay- enclosed the minutes from the faculty meeting last.

Also- please cool off on the use of DARI as the means to carry out this FAO work. Dari may be a good place to do it but it also may not be. It may be more to our advantage to institutionalize some of it at The TAXlab at CU. Curt agrees in part and Crowe (to who Curt reported after the DC trip) is somewhat enthused. He was glad to see your work paying off and is amenable to assist in certain ways (maybe reduction in overhead charges). So go slow on DARI because McMillian wants to go to fast.

Time to say goodbye

I hope you don't frighten with my typing=

~~love~~ love to connie

G11

Gil

PS-

*your request for reprint
sendings has arrived - I'll take
care of it. -over*

PS

There are some problems with the book (manip t of North America)

first-the charges for Gammon are being picked up by us but we don't have as surfit of funds.

Second- the publisher has said that the costs of ~~printing~~ bringing it out now maybe 20-30 % higher than estimated three years ago. Inflation in the industry is that much. He said that he doesn't know where those funds will be found either, since the press is \$10k in the red at this time. He certainly did not have the money to pay Gammon for redoing a good deal of the lay out work,

Third- we called appan to make some of the layout decisions. I asked Gammon to tell him that he would have to come up with some of the costs for ~~her~~ her time and that there might ~~be~~ even be more costs associated with the book by the time it was out.

Appaq said he could not undertand this since there was at least a \$20k bud get to cover the book and Gammon's work. She told him (at my prompting) that there was only \$10k/ He did not believe her and asked for letters from the press (Schwartz). These were sent to him. He said that he would lay the problem to rest on your shoulders- although I told Gammon to say that you had instructed her to contact Appan with any problems after you left ~~g~~ for Rome. At this date I can only assume that Old Appan has washed his hands of the matter or is refereing to you.

We will not have the money to pay for su-vention beyond the \$5000 from NSF and we will be able to pay for Gammon for another account if

^{you want ,e}
we to do this but I ~~think~~ think the pressure should be on our Indian friend if he really wants the book out.

Advise me on this- if you please.

G