North Carolina State University
School of Agriculture and Life Sciences

Department of Zoology
Box 7617
Raleigh, N. C. 27695-7617

August 4, 1988

Dr. Lawrence M. Clark
Office of the Chancellor
Box 7001
NCSU Campus

Dear Larry:

I am pleased that we have been able to arrange for the transfer of services of Dr. William C. Grant to your office to assist in the development of our advising program on campus. After conversations with Mr. Hugh Fuller's office I understand the arrangements are for us to receive $17,267 representing approximately 30% of Dr. Grant's salary for the 12-month period from July 1, 1988 through June 30, 1989. There was an apparent problem because of 9/12 month appointment differences but this seems to have been cleared up. We will process the paper work to make this appointment effective July 1.

I hope this involvement with your office will be beneficial both for the campus and for Dr. Grant's program. I know he looks forward to working with you and to developing a better advising system for students at NCSU.

Sincerely,

John G. Vandenbergh
Professor and Head

JGV:shw
cc Dr. James Oblinger
Dr. Durwood Bateman
Dr. William Grant
Mr. Hugh Fuller

APPENDIX B

NSF YOUNG SCHOLARS PROGRAM DATA SHEET

Part I - Project Information

(Note: Part I of this form is designed for direct computer input and will be used for review panel assignment. Please check all entries for completeness and accuracy.)

Institution North Carolina State University

PI/PD Name(s) Blanche C. Haning and Marianne N. Feaver

NSF Request (**1st year only**): 55775

DISCIPLINE FOCUS

12-Chemistry	____ %
13-Physics	____ %
21-Math	____ %
31-Computer Sci	____ %
49-Earth Sci	____ %
59-Engineering/Tech	____ %
69-Life Sci	100 %
89-Social Sci/Psych	____ %
19-General Physical Sci	____ %
99-Other ____	____ %
TOTAL	100 %

PARTICIPANT GRADE LEVEL

B-Entering 8th-9th Grade	50 %
C-Entering 10th-12th Grade	50 %
Other ____	____ %
TOTAL	100 %

TARGET POPULATION (Check only if these groups are a special focus of this project i.e. ≥50% of participants)

F1-Gifted/Talented	____
F2-Minorities	X
F3-Disabled	____
F4-Econ Disadv	____
G1-Women	X
G3-Rural	

NON-NSF CONTRIBUTION:

Grantee Institution	---,---
Corporate/Other	---,---
External Group	---,---
H/I—Total	$ ---,---

K1-PROJECT STATUS: X (N) New Activity

____ (E) Established Activity (refer to Announcement p.3)

K2-K4 TOTAL NO. OF PARTICIPANTS 40

Entering 8th Grade	20
Entering 9th Grade	20
Entering 10th Grade	---
Entering 11th Grade	---
Entering 12th Grade	---
Other ____	---

L1 *MAJOR* PROJECT SITE (Check one)

☒ 1 = Same as Submitting Org

☐ 2 = Other ____

L2 PROJECT TYPE (Check one)

X 1 = summer residential

____ 2 = summer commuter

____ 3 = summer resid & commuter

____ 4 = academic year only

L3-L4 NO. WEEKS SUMMER PROJECT 3

For proposals from states that require Intergovernmental Review of Federal Programs (see Appendix C), indicate State Proposal Number ____.

– continued

National Science Foundation

Young Scholars Program

PROPOSAL SUMMARY

So This Is Biology!

The College of Agriculture and Life Sciences of North Carolina State University, Raleigh, will conduct a three week residential workshop during summers of 1989 and 1990 for forty rising ninth and tenth grade high school students. The objectives of the workshop are (1) to acquaint students with the theory and application of the scientific method and (2) to help them understand that careers in science research and teaching are human endeavours shaped by individuals' personal goals, imaginations, and moral values. The vast and vital subject matter of the life sciences is the disciplinary focus of the workshop.

Participants will conduct research in life science laboratories of their choosing under the guidance of NCSU faculty. They will summarize their research on posters for review by high school science teachers, parents, and faculty. They will visit several biotechnology research laboratories in the North Carolina Research Triangle Park. Also students and teachers will take a weekend field trip to the North Carolina coast to study natural flora and fauna, and the environmental, economic, and ethical conflicts arising there from human activities. On-campus programs include considerable one-on-one interaction with workshop leaders, other NCSU scientists and support staff through lectures, forums, round table discussions and "business" luncheons. Trips to local science museums and planned recreational activities complete the learning/living pre-college experience.

Participant selection is focused on the "apparent" under-achiever whose B-grade performance actually may involve personality and ability traits that allow very successful careers in science research and teaching. Recruitment will focus on women and minorities. High school science teachers will be invited to parts of the workshop, thereby further extending the workshop information and experience

So This Is Biology!
A Workshop Offering A Taste of the Joys, Challenges, and Tribulations of Conducting Biological Research in Modern Society.

Table of Contents

(SEE INSTRUCTIONS ON REVERSE BEFORE COMPLETING)

~~SUMMARY~~ YEAR ONE (1989)

PROPOSAL BUDGET

FOR NSF USE ONLY

PROPOSAL NO. | DURATION (MONTHS) Proposed | Granted

AWARD NO.

ORGANIZATION: North Carolina State University

PRINCIPAL INVESTIGATOR/PROJECT DIRECTOR: Blanche C. Haning

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title; A.6. show number in brackets)	NSF FUNDED PERSON-MOS. CAL.	ACAD	SUMR	FUNDS REQUESTED BY PROPOSER	FUNDS GRANTED BY NSF (IF DIFFERENT)
1. Blanche C. Haning			1.3	$ 5640	$
2. Marianne N. Feaver			1.0	3506	
3.					
4.					
5. ( ) OTHERS (LIST INDIVIDUALLY ON BUDGET EXPLANATION PAGE)				- 0 -	
6. (2) TOTAL SENIOR PERSONNEL (1-5)				9146	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. ( ) POST DOCTORAL ASSOCIATES				- 0 -	
2. (4) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)				- 0 -	
3. ( ) GRADUATE STUDENTS				- 0 -	
4. (3) UNDERGRADUATE STUDENTS				- 0 -	
5. (1) SECRETARIAL-CLERICAL				- 0 -	
6. ( ) OTHER				- 0 -	
TOTAL SALARIES AND WAGES (A+B)				9146	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				2040	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A+B+C)				11186	
D. PERMANENT EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $1,000.)					
TOTAL PERMANENT EQUIPMENT				- 0 -	
E. TRAVEL 1. DOMESTIC (INCL. CANADA AND U.S. POSSESSIONS)				510	
2. FOREIGN				- 0 -	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ - 0 -					
2. TRAVEL 2800					
3. SUBSISTENCE 21360					
4. OTHER 11800					
TOTAL PARTICIPANT COSTS				35960	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				1000	
2. PUBLICATION COSTS/PAGE CHARGES					
3. CONSULTANT SERVICES					
4. COMPUTER (ADPE) SERVICES					
5. SUBCONTRACTS					
6. OTHER				876	
TOTAL OTHER DIRECT COSTS				1876	
H. TOTAL DIRECT COSTS (A THROUGH G)				49532	
I. INDIRECT COSTS (SPECIFY) All items including student participant costs @ 46%					
TOTAL INDIRECT COSTS				6243	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				55775	
K. RESIDUAL FUNDS (IF FOR FURTHER SUPPORT OF CURRENT PROJECTS SEE GPM 252 AND 253)				- 0 -	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				$ 55775	$

PI/PD TYPED NAME & SIGNATURE*: Blanche C. Haning — Blanche C. Haning — DATE: 7/24/87

INST. REP. TYPED NAME & SIGNATURE* — DATE: AUG 2 1988

FOR NSF USE ONLY

INDIRECT COST RATE VERIFICATION

Date Checked | Date of Rate Sheet | Initials - DGC

Program

NSF Form 1030 (1-87) *Supersedes All Previous Editions*

*SIGNATURES REQUIRED ONLY FOR REVISED BUDGET (GPM 233)

BUDGET EXPLANATION (Year one: 1989)

Senior Personnel	NSF Funds($)	Other Funds($)
A.1. Blanche C. Haning, P.I.		
1.3 mo. summer	5640	-0-
1.0 mo. A.Y.	-0-	4512
A.2. Marianne N. Feaver, Co.P.I.		
1.0 mo. summer	3506	-0-
1.0 mo. A.Y.	-0-	3506
Other Personnel		
B.2a. Larry Ray Grimes Workshop Leader 1.2 mo. summer	-0-	5000
B.2b. C. Michael Williams Workshop Leader 1.2 mo. summer	-0-	5000
B.2c. Charles Collins, Residence Dir. .75 mo. summer	-0-	3000
B.2d. Erin Malloy-Hanley, Ethician 3 days, summer	-0-	400
B.5. Bookkeeper	-0-	1000
B.6. 3 undergrad. interns .75 mo. summer includes room and board in dorms	-0-	1000
Total Salaries	9146	23418
C. Fringe Benefits (22.3% of salaries)	2040	5222
Total Salaries, Wages, Benefits	11186	28640
PERMANENT EQUIPMENT		
D.1. 2 Macintosh computers, printers and software	-0-	6700
Total Permanent Equipment	-0-	6700
TRAVEL		
E.1a. Round trip and per diem, Proj. Dir. Conf., Wash. D.C.	510	-0-
E.2a. Follow-up visits to participants' high schools; per diem and car rental	-0-	1000

Total Travel	510	1000
STUDENT PARTIPANT COSTS		
F.3a. Dormitory lodging ($15./night/student)	12600	-0-
F.3b. Lodging at 4-H camp ($7./night/student) for weekend field trip (2 nights)	560	-0-
F.3c. Meals in university dining hall ($11/day/student) (15 days plus several other meals and bag lunches)	7000	-0-
F.3d. Meals during weekend field trip (2.5 days) ($15./student/day)	1200	-0-
F.2. Transportation for weekend field trip, Research Triangle Park field trips, and several evening trips to educational facilities as NC Museum of Natural Sciences, NC Museum of Science and Technology; gas, drivers, van rental	2800	-0-
F.4a. Boat rental/supplies for weekend field trip	1000	-0-
F.4b. Grants for supplies for research faculty who will work with partipants ($200.-500 based on need)	10000	-0-
F.4c. Awards luncheon for students (and families and high school science teachers: graduation	-0-	1500
F.4d. NCSU t-shirts for students	-0-	250
F.4e. NCSU Health Services ($20./student)*	800	-0-
Total Student Partipant Costs	35960	1750
RESIDUAL FUNDS	-0-	-0-
OTHER DIRECT COSTS		
G.1a. Film rental/purchase; software purchase; poster boards, related material	1000	600
G.1b. 3 polaroid cameras, film, and developing costs	-0-	400
G.2. Duplicating and binding educational materials	-0-	250
G.6a. Graduation certificates	-0-	200
G.6b. Personnel support costs		

for 20 high school science teachers for weekend field trip: room ($7./night/person) and board ($15/person/day) (2.5 days, 2 nights at 4-H camp)	500	-0-
G.6c. Room and board (See $, E.2) for 2 P.I. and 2 workshop leaders	120	-0-
G.6d. Room and board in dorm for residence director ($16./single room for 16 nights)	256	-0-
Total Other Direct Costs	1876	1450
Total Direct Costs	49532	39540
INDIRECT COSTS NCSU overhead of items exluding student participant costs @ 46%	6243	-0-
Total Direct/Indirect Costs	55775	39540

---

*North Carolina State University requires that all students attending the campus for an organized activity must be insured. We will obtain a policy to cover the participants during the 3-week workshop at a cost of $20./student from Hartford Insurance Company. Routine health care will take place at the NCSU Health Services. (This procedure is standard for comparable activities conducted at NCSU.)

(SEE INSTRUCTIONS ON REVERSE BEFORE COMPLETING)

~~SUMMARY~~ YEAR TWO (1990)

PROPOSAL BUDGET

FOR NSF USE ONLY

PROPOSAL NO. | DURATION (MONTHS) Proposed | Granted

AWARD NO.

ORGANIZATION: North Carolina State University

PRINCIPAL INVESTIGATOR/PROJECT DIRECTOR: Blanche C. Haning

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title; A.6. show number in brackets)	NSF FUNDED PERSON-MOS. CAL.	ACAD	SUMR	FUNDS REQUESTED BY PROPOSER	FUNDS GRANTED BY NSF (IF DIFFERENT)
1. Blanche C. Haning			1.3	$ 6204	$
2. Marianne N. Feaver			1.0	3856	
3.					
4.					
5. ( ) OTHERS (LIST INDIVIDUALLY ON BUDGET EXPLANATION PAGE)					
6. (2) TOTAL SENIOR PERSONNEL (1-5)					
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. ( ) POST DOCTORAL ASSOCIATES					
2. (4) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)					
3. ( ) GRADUATE STUDENTS					
4. (3) UNDERGRADUATE STUDENTS					
5. (1) SECRETARIAL-CLERICAL					
6. ( ) OTHER					
TOTAL SALARIES AND WAGES (A+B)				10060	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				2243	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A+B+C)				12303	
D. PERMANENT EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $1,000:)					
TOTAL PERMANENT EQUIPMENT				- 0 -	
E. TRAVEL 1. DOMESTIC (INCL. CANADA AND U.S. POSSESSIONS)				525	
2. FOREIGN				- 0 -	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ - 0 -					
2. TRAVEL 3000					
3. SUBSISTENCE 21360					
4. OTHER 11900					
TOTAL PARTICIPANT COSTS				36260	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				1200	
2. PUBLICATION COSTS/PAGE CHARGES					
3. CONSULTANT SERVICES					
4. COMPUTER (ADPE) SERVICES					
5. SUBCONTRACTS					
6. OTHER				876	
TOTAL OTHER DIRECT COSTS				2076	
H. TOTAL DIRECT COSTS (A THROUGH G)				51164	
I. INDIRECT COSTS (SPECIFY) All items including student participant costs @ 46%					
TOTAL INDIRECT COSTS				6856	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				58020	
K. RESIDUAL FUNDS (IF FOR FURTHER SUPPORT OF CURRENT PROJECTS SEE GPM 252 AND 253)				- 0 -	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				$ 58020	$

PI/PD TYPED NAME & SIGNATURE* Blanche C. Haning — Blanche C. Haning — DATE 7/28/88

INST. REP. TYPED NAME & SIGNATURE* — DATE AUG 2 1988

FOR NSF USE ONLY

INDIRECT COST RATE VERIFICATION

Date Checked | Date of Rate Sheet | Initials - DGC | Program

NSF Form 1030 (1-87) *Supersedes All Previous Editions*

*SIGNATURES REQUIRED ONLY FOR REVISED BUDGET (GPM 233)

BUDGET EXPLANATION (Year two: 1990)

Senior Personnel	NSF Funds($)	Other Funds($)
A.1. Blanche C. Haning, P.I.		
1.3 mo. summer	6204	-0-
1.0 mo. A.Y.	-0-	4963
A.2. Marianne N. Feaver, Co.P.I.		
1.0 mo. summer	3856	-0-
1.0 mo. A.Y.	-0-	3856
Other Personnel		
B.1a. Larry Grimes		
Workshop Leader		
1.2 mo. summer	-0-	5500
B.2b. C. Michael Williams		
Workshop Leader		
1.2 mo. summer	-0-	5500
B.2c. Charles Collins, Residence Dir.		
.75 mo. summer	-0-	3500
B.2d. Erin Malloy-Hanley, Ethician		
3 days, summer	-0-	500
B.5. Bookkeeper	-0-	1200
B.6. 3 undergrad. interns		
.75 mo. summer includes room and board in dorms	-0-	1300
Total Salaries	10060	26319
C. Fringe Benefits		
(22.3% of salaries)	2243	5869
Total Salaries, Wages, Benefits	12303	32188
PERMANENT EQUIPMENT		
D.1. 1 Macintosh computer, printer, software	-0-	3000
Total Permanent Equipment	-0-	3000
TRAVEL		
E.1a. Round trip and per diem, Proj. Dir. Conf., Wash. D.C.	525	-0-
E.1b. Follow-up visits to participants' high schools; per diem and car rental	-0-	1000

Total Travel	525	1000
STUDENT PARTIPANT COSTS		
F.3a. Dormitory lodging ($15./night/student)	12600	-0-
F.3b. Lodging at 4-H camp ($7./night/student) for weekend field trip (2 nights)	560	-0-
F.3c. Meals in university dining hall ($11/day/student) (15 days plus several other meals and bag lunches)	7000	-0-
F.3d. Meals during weekend field trip (2.5 days) ($15./student/day)	1200	-0-
F.2. Transportation for weekend field trip, Research Triangle Park field trips, and several evening trips to educational facilities as NC Museum of Natural Sciences, NC Museum of Science and Technology; gas, drivers, van rental	3000	-0-
F.4a. Boat rental/supplies for weekend field trip	1100	-0-
F.4b. Grants for supplies for research faculty who will work with partipants ($200.-500 based on need)	10000	-0-
F.4c. Awards luncheon for students (and families and high school science teachers: graduation	-0-	1500
F.4d. NCSU t-shirts for students	-0-	250
F.4e. NCSU Health Services ($20./student) *	800	-0-
Total Student Partipant Costs	36260	1750
RESIDUAL FUNDS	-0-	-0-
OTHER DIRECT COSTS		
G.1a. Film rental/purchase; software purchase; poster boards, related material	1200	600
G.1b. polaroid film and developing costs	-0-	300
G.2. Duplicating and binding educational materials	-0-	250
G.6a. Graduation certificates	-0-	200
G.6b. Personnel support costs		

for 20 high school science teachers for weekend field trip: room ($7./night/person) and board ($15/person/day) (2.5 days, 2 nights at 4-H camp)	500	-0-
G.6c. Room and board (See $, E.2) for 2 P.I. and 2 workshop leaders	120	-0-
G.6d. Room and board in dorm for residence director ($16./single room for 16 nights)	256	-0-
Total Other Direct Costs	2076	1350
Total Direct Costs	51164	39288
INDIRECT COSTS NCSU overhead of items not including student participant costs @ 46%	6856	-0-
Total Direct/Indirect Costs	58020	39288

---

*North Carolina State University requires that all students attending the campus for an organized activity must be insured. We will obtain a policy to cover the participants during the 3-week workshop at a cost of $20./student from Hartford Insurance Company. Routine health care will take place at the NCSU Health Services. (This procedure is standard for comparable activities conducted at NCSU.)

(SEE INSTRUCTIONS ON REVERSE BEFORE COMPLETING)

SUMMARY PROPOSAL BUDGET

APPENDIX IV

FOR NSF USE ONLY		
PROPOSAL NO.	DURATION (MONTHS) Proposed	Granted
AWARD NO.		

ORGANIZATION: North Carolina State University

PRINCIPAL INVESTIGATOR/PROJECT DIRECTOR: Blanche C. Haning

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title; A.6. show number in brackets)	NSF FUNDED PERSON-MOS. CAL.	ACAD	SUMR	FUNDS REQUESTED BY PROPOSER	FUNDS GRANTED BY NSF (IF DIFFERENT)
1. Blanche C. Haning			2.6	$ 11844	$
2. Marianne N. Feaver			2.0	7362	
3.					
4.					
5. ( ) OTHERS (LIST INDIVIDUALLY ON BUDGET EXPLANATION PAGE)					
6. (2) TOTAL SENIOR PERSONNEL (1-5)					
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. ( ) POST DOCTORAL ASSOCIATES					
2. (4) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)					
3. ( ) GRADUATE STUDENTS					
4. (3) UNDERGRADUATE STUDENTS					
5. (1) SECRETARIAL-CLERICAL					
6. ( ) OTHER					
TOTAL SALARIES AND WAGES (A+B)				19206	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				4283	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A+B+C)				23489	
D. PERMANENT EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $1,000:)					
TOTAL PERMANENT EQUIPMENT					
E. TRAVEL 1. DOMESTIC (INCL. CANADA AND U.S. POSSESSIONS)				1035	
2. FOREIGN					
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $					
2. TRAVEL 5800					
3. SUBSISTENCE 42720					
4. OTHER 23700					
TOTAL PARTICIPANT COSTS				72220	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				2200	
2. PUBLICATION COSTS/PAGE CHARGES					
3. CONSULTANT SERVICES					
4. COMPUTER (ADPE) SERVICES					
5. SUBCONTRACTS					
6. OTHER				1752	
TOTAL OTHER DIRECT COSTS				3952	
H. TOTAL DIRECT COSTS (A THROUGH G)				100696	
I. INDIRECT COSTS (SPECIFY)					
TOTAL INDIRECT COSTS				13099	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				113795	
K. RESIDUAL FUNDS (IF FOR FURTHER SUPPORT OF CURRENT PROJECTS SEE GPM 252 AND 253)				- 0 -	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				$ 113795	$

PI/PD TYPED NAME & SIGNATURE*: Blanche C. Haning — Blanche C. Haning — DATE: 7/28/88

INST. REP. TYPED NAME & SIGNATURE* — DATE: AUG 2 1988

FOR NSF USE ONLY

INDIRECT COST RATE VERIFICATION

Date Checked	Date of Rate Sheet	Initials DGC
		Program

NSF Form 1030 (1-87) *Supersedes All Previous Editions*

*SIGNATURES REQUIRED ONLY FOR REVISED BUDGET (GPM 233)

Current and Pending Support for Research and Education in Science and Engineering

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of the proposal.

I. Name of Principal Investigator Blanche C. Haning	Source of Support	Project Title	Award Amount (or Annual Rate)	Period Covered by Award	Person-Months or % of Effort Committed to the Project			Location of Research
					ACAD.	SUMM.	CAL. YR.	
A. *Current Support* List—if none, report none	None							
B. *Proposals Pending* 1. List this proposal	NSF NCSU	So This Is Biology!	5640 4512		1.0	1.3		NCSU
2. Other pending proposals, including renewal applications. If none, report none.	None							
3. Proposals planned to be submitted in near future. If none, report none.	None							
II. Name of co-principal investigator and/or faculty associate A. Marianne N. Feaver	NSF		3506			1.0		NCSU
B. _____	NCSU		3506		1.0			
III. Transfer of Support If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.	N/A							
IV. Other agencies to which this proposal has been/will be submitted	None							

USE ADDITIONAL SHEETS AS NECESSARY

NSF FORM 1239 (1-87)

SO THIS IS BIOLOGY!

A Workshop Offering a Taste of the Joys, Challenges, and Tribulations of Conducting Biological Research in Modern Society.

PROJECT GOALS AND OBJECTIVES

The workshop introduces students to the challenging world of research in the life sciences with an emphasis on basic biology and related careers including teaching. There are two objectives. (1) Students will learn the scientific method and apply this information by working with faculty in on-going research programs or on projects specifically designed for them. (2) Students will improve their understanding of science research and teaching as human endeavors. To accomplish these objectives, the workshop offers a variety of learning situations including classroom and laboratory instruction, discussion sessions, business luncheons, visits to research laboratories in the North Carolina Research Triangle Park, and a week-end field trip. Students will have opportunity for intensive interaction with workshop leaders, practicing scientists, science teachers, and allied professionals. Students will examine the likely impacts of recent biological research on society, and conversely, the potential impacts of society on the pursuit and use of scientific information. Improved understanding of ethics and the increasingly complex ethical dimensions of contemporary science will be emphasized throughout the workshop. The workshop provides an holistic perspective of the role of the life sciences in the world realm. In so doing, it provides considerable opportunity for constructive learning, self expression, and personal growth by participants.

DISCIPLINARY FOCUS

The disciplinary focus of the workshop is the life sciences and their interdisciplinary and ethical ramifications, especially biotechnological and environmental projects and issues.

PROJECT DESIGN

DISCIPLINE AND RESEARCH FOCUSED ACTIVITIES INCLUDING SCHEDULE OF ACTIVITIES

Students will learn that scientific inquiry is an open ended intellectual activity that incorporates technologies (sampling methods, use of computers, etc.) that are increasingly exact and procedures (hypothesis testing and modification) that are self-correcting. They will learn that researchers are practitioners of the scientific method applied in a specific area; hence, the parameters of the scientific method must be clearly understood by scientists, science teachers, and citizens. Students will increase their understanding of the scientific method (WORKSHOP OBJECTIVE ONE) through the following activities:

(1) by doing computer exercises that allow practice in formulating and modifying hypotheses. "Tribbles" is one such exercise that places students in a space ship and requests they derive the "rules" governing births and deaths of organisms (tribbles) by observing their appearance and disappearance in the population depicted on a grid. It is an excellent interactive first

exploration of the scientific method for several reasons. It relies only on observational data thereby destroying the misconception that the experiment is the scientific test. It also forces students to organize their data because the program offers them complex and confusing patterns of information. In fact, some "rules" can only be discovered by students' pooling their data on what didn't work, thus demonstrating that scientific inquiry negates hypotheses and does not prove them.

(2) by working in the laboratories of different research scientists in NCSU's College of Agriculture and Life Sciences. Students will either participate in on-going research projects or conduct short term projects specifically designed for them. This activity allows for further understanding of the scientific method and personal exposure to research scientists. For example, students will have opportunity to work with Dr. John Roberts, Director of the NCSU Monoclonal Antibody Center, in his laboratory where they will be exposed to all aspects of monoclonal antibody preparation by taking part in several on-going projects in the sequence normally required to produce a specific antibody. Students will learn how to tissue culture, obtaining from cultures crude preparations of membranes with which to immunize animals. They will learn various animal laboratory techniques ranging from basic handling of animals to more sophisticated serological and immunological assays for identifying specific antibodies. --Dr. Roberts and his associates have worked successfully with high school students and teachers in the past.

(3) by summarizing their research results in a poster session to be reviewed by high school science teachers, parents, and NCSU faculty at the conclusion of the workshop. The purpose of this activity is that students learn that scientific inquiry is not complete until the research results are communicated. Posters are an effective means of accomplishing this. Faculty will assist students in developing posters using Macintosh computers and programs that are user-friendly with considerable graphic ability. We also will have 3 polaroid cameras so that students can take pictures of their research projects. A high faculty-student ratio for this activity is planned so that students can focus on what they should present in the poster rather than on the mechanics of developing the poster. Explanations of the elements of data communication by posters will be given and examples of scientific posters will be exhibited. Students will increase their understanding of scientific research as a human venture with ethical dimensions (WORKSHOP OBJECTIVE TWO) by considering the following points through readings, formal lectures, and interactive discussions with faculty throughout the workshop.

-that research and teaching are conducted by humans each bringing to that endeavor his/her unique imagination, ability, and value system. These are the personal qualities that shape the nature of scientific inquiry and instruction beginning with the decision of what phenomena will be investigated or taught. Many "discoveries" result from one person's synthesis or perspective of existing data.

-that research is conducted in a society that respects data and conclusions generated by the scientific method. To most scientists' dismay and in total disregard of the true nature of scientific inquiry, there remains in society a tendency to relegate scientific fact to the status of "truth". Society expects a scientist's work to be exact, verifiable, and totally objective even

if the activities of the scientist are not understood. This puts tremendous responsibility on those who would practice and teach science.

-that society also consists of some competitive and self-serving groups that exert powerful influence on the nature and application of scientific knowledge. This influence may be negative, causing wrongful application of scientific knowledge or denying basic support or rightful communication of results even in the scientific community. The influence, in contrast, may be supportive and positive. Students must learn that each of us, citizen and scientist alike, belongs to one or more of these groups and that such membership as well as personal traits, commitments, and values, shape the nature of scientific inquiry as well as application of the results.

-that in an increasingly-complex world, scientific knowledge by itself may not be sufficient to resolve many major problems even though their essence resides in the biological world. Who expects human population control or the judicious use of diminishing natural resources to be solved by data gathering alone? The hypotheses supported by such data at best offer clues to solutions and at worst are conflicting or equally plausible in implication. Biologists must turn to peers of different expertise, often outside scientific circles, to integrate information and propose holistic explanations and ethical solutions. Students will realize that respect for interdisciplinary expertise, and understanding the limitations of scientific methods are essential aspects of "good" science and responsible citizenship.

Students will improve their understanding of the human dimension of science through the following activities:

(1) studying the history (backgrounds and personalities) of successful scientists. We will have short films and reading assignments that examine the lives of scientists who are considered great contributors to the understanding of our planet; for example, Albert Einstein who had learning disabilities, who initially failed his university admission exam, and who had difficulty getting a job. The individualism of scientists and the ultimate benefits of their scientific research will be the basis for our selections. (See REFERENCES AND OTHER RESOURCES for examples of texts, films, tapes, computer programs, slide-tapes.)

(2) hearing first-hand the autobiographies of several successful scientists in NCSU's College of Agriculture and Life Sciences, especially our seven members (six living) of The National Academy of Science: Dr. Stanley G. Stevens, William Neal Reynolds Professor (emeritus) of Genetics; Dr. Ellis B. Cowling, Professor of Plant Pathology and Forestry; Dr. Major M. Goodman, Professor of Crop Science, Statistics, Genetics, and Botany; Dr. Clement Markert, Distinguished University Research Professor (reproductive biology and mammalian genetics); Dr. Paul Kramer, Visiting Scientist in The Department of Botany and former James B. Duke Professor of Botany at Duke University; and Dr. C. Clark Cockerham, William Neal Reynolds Professor of Statistics and Genetics. Numerous other recognized NCSU faculty will be invited to interchange with students in both formal and informal settings. Students previously will have formulated questions they would like addressed as part of these presentations. We will encourage questions regarding "the most" and "the least" satisfying aspects of the invited scientists' professional lives as researchers and/or teachers as well as the ethics they hold dear.

(3) examining controversies surrounding the intensive use of our natural resources, and also, the use of biotechnology in medicine. We selected these topics because they require highly integrated perspectives and ethical considerations for both contemporary and future generations. Also, expertise exists on the NCSU campus and in area public and private agencies to initiate and guide discussions. A field trip to the North Carolina coast where intensive human intrusion is occurring will be the focus of the natural resources study. Readings, films, and discussions on such topics as genetic engineering, embryo implantation in surrogate mothers, etc., will provide the bases for the biotechnology-in-medicine debate. (See REFERENCES AND OTHER RESOURCES for examples of texts, films, tapes, computer programs, and slide-tapes that will be used for these discussions.)

(4) by several evening presentations by faculty addressing such topics as:

-science as part of the whole human experience (Dr. John Riddle)
-the need for good communication abilities (Dr. Rebecca Leonard)
-opportunities for women in science (Dr. Elizabeth Theil)
-opportunities for Black Americans and other minorities in Science (Dr. Lawrence Clark)
-the life of an environmental lobbyist (Mr. Robert Hollman)
-on what scientists might do in their spare time (Dr. Blanche C. Haning)

(5) by group discussions on scientific/environmental issues of their choosing culminating in an oral forum to be the featured activity on 7/19/89 (See SCHEDULE OF WORKSHOP ACTIVITIES.). Topics will be approved in advance by the principal investigators and workshop leaders for multidisciplinary and ethical content. Students also will have opportunity to develop oral presentations for delivery at the 7/26/89 awards ceremony on such topics as : The joys and sorrows of attending a summer workshop of the business of modern biology; the trials and rewards of being a scientist/science teacher today; or the biologist: a personality dissection.

SCHEDULE OF WORKSHOP ACTIVITIES
June 25-30, July 10-22, 1989

Date	Time	Description of activity
6/25/89	13:00-17:00	Students arrive and register. Official welcome to workshop.

Week 1: Monday, students will meet with workshop staff and be introduced more rigorously to the objectives of the workshop. Tuesday through Friday, students will meet during the morning for presentations, discussions and exercises relating to the scientific method, lives of scientists and science as a human endeavor. In the afternoons, they will work on their research projects in the laboratories of their choosing. A tentative schedule of specific activities follows.

6/26/89	9:00-12:00	Workshop agenda discussed, presentations, and round table discussions of the career opportunities for teaching and research in the life sciences.
	12:00-13:30	Lunch with workshop leaders and organizers
	13:30-16:30	Presentation of available laboratory projects, assignment of students to projects. Students meet with their research scientist partners and learn more about their projects.
	18:30-20:30	Social with residence director, student interns, principal investigators and workshop leaders. The agenda of nightly recreational/educational activities is discussed.
6/27/89	8:30-12:00	Students will view short films on the lives of famous scientists; discussion afterwards of the personalities and backgrounds of scientists in films. Students also begin computer exercises on the scientific method.
	12:00-13:30	Business lunch with project leaders. Topic of conversation: designing the questionnaire for visiting scientists who will discuss their career choices, values and lives
	13:30-16:30	Students work in the laboratories of their choosing on their research projects.
	18:30-20:30	First night seminar program: Dr. Elizabeth Theil: Opportunities and Problems of Women and Minorities in Science
6/28/89	8:30-12:30	Trip to the biotechnology research laboratory of Ciba-Geigy in Research Triangle Park. Luncheon discussion on the nature of the company's research and associated technology, its societal impact, and the quality of life enjoyed by involved scientists.
	13:30-16:30	Students work on their research projects.
	18:30-21:30	R, R and R. Rest, Relaxation and Reading. (One 60 min. group activity always included).
6/29/89	8:30-12:00	More work on the rigor and limitations of the scientific method. Films on new developments in science followed by discussions of societal impact of these developments.
	13:30-16:30	Students work on their research projects.
	18:30-20:30	Seminar: Dr. John Riddle, The Global Setting of Science, its Potential Contribution, Limitations and Where Else to Look for Answers.
6/30/89	8:30-12:00	Films followed by discussion on some problems of diminishing resources and their societal ramifications. Students divide themselves into small groups (3-4) to investigate critically the economic, ethical and scientific issues of controversies surrounding environmental problems or application of biotechnology.
	13:30-16:30	Students work on research projects.

RECESS: Dismissal for Week, 7/1/89-7/9/89

Week 2: During the second week of the workshop students will spend as much time as possible working on their research projects. They will break for long "business" luncheons in which they will (1). work on their small group projects on the issues (economic, ethical and scientific) surrounding specific societal problems or (2). met with scientists to discuss the benefits and problems of their professions.

7/10/89-7/14/89	8:30-12:00	Students work on research projects.
7/10,12, 14/89,	11:30-13:30	Students meet with invited scientists over lunch to discuss career choices
7/11/89, 7/13/89	11:30-13:30	Lunches with issue discussion groups.
7/10/89-7/14/89	13:30-16:30	Students work on research projects.
7/10,12, 14/89	18:30-21:30	R, R and R.
7/11/89, 7/13/89	18:30-20:30	Seminars: Mr. Robert Hollman, Local Resource Problems Facing Every North Carolinian. Dr. Rebecca Leonard: The Need for Good Speech and Writing Skills.

Field Trip to the North Carolina Coast: 7/14/89 (19:00)-7/16/89 (16:00) Students will be introduced to the area's unique topography, its biological richness and ecological problems. Science teachers from participating high schools will be invited to attend. After arrival at the Duke University Marine Station, students will participate in a night plankton sampling exercise to view bioluminescence. Students will visit salt marches and estuaries the next day to view their biological diversity. That evening the importance of these habitats to N. C. economics (through the fishing industry), and the problems land development poses for the survival of these habitats, will be discussed. Also, an Saturday afternoon trawling trip and a Sunday morning trip to the NC Marine Resource Center will acquaint the students with the oceanic environment, and its importance to the world.

Week 3: Students will devote the last week to working on the posters summarizing their research projects, preparing their controversial issues forum and their group presentations for the awards ceremony. We expect this to be a week of vigorous activity. We will punctuated this flurry of activity with two visits to local research laboratories.

7/17/89	8:30-12:00	Students work on posters!
	13:30-16:30	More work on posters and controversial issue presentations.
	18:30-21:30	R, R and R
7/18/89	8:30-12:00	Trip to research laboratory. Embrex Corp., Research Triangle Park, and discussion of the environmental ramifications of the research conducted and technology developed there.
	13:30-17:30	Work on posters and controversial issue presentations.
	18:30-20:30	Informal discussion with NCSU counselors on solving study problems and college preparation.
7/19/89	8:30-12:00	Forum on the Economic, Ethical and Scientific Issues Surrounding Major Problems Facing Society. Each group of students presents its summary of the major issues surrounding their chosen problem and their assessment of the expertise required to solve it.
	13:30-17:30	Students divide themselves into groups (6-10) to work on the speeches/ presentations to be made at the awards ceremony. Also, Exercise in Bioethics, Its Meaning in Today's Society: Exercise Leader, Dr. Erin Mallog-Hanley.
	18:30-21:30	R, R, and R
7/20/89	8:30-12:00	Trip to research laboratory Burroughs-Welcome Pharmaceutical Corp., to view the health related research conducted there. Discussion follows on the societal impact of the research conducted there.
	13:30-17:30	Students finish posters and work on presentations for awards ceremony.
	18:30-20:30	Seminar: Dr. Lawrence Clark, Opportunities for Minorities in Science
7/21/89	8:30-17:30	Students work on presentations for awards ceremony
	18:30-20:30	Farewell dinner and social.
7/22/89	10:00-14:00	Awards ceremony.

CAREER AWARENESS ACTIVITIES

This topic will be developed by examining a globe, and having students elaborate on its biological, physical, and social dimensions, and corresponding career opportunities. Need for interdisciplinary information, cooperative attitudes, and ethical behavior will be emphasized. A panel of faculty will be in attendance to guide discussions and further clarify career needs and challenges over the short and long term. Students will summarize this information in a "systems perspective" on a chart (Wilson, 1986) and will explain their 1st and 2nd career choices based on this exercise.

Throughout the workshop but particularly during the field trips to research laboratories in the N.C. Research Triangle Park and the Duke University Marine Biology Station on the N.C. coast, arrangements will be made to have students interact with professional non-scientists who are part of the research organization: public relations personnel, science writers, accountants, artists, programmers, etc., so that they see the numerous career opportunities associated with work in the life science disciplines.

Academic preparation (in high school, and in colleges and universities) for careers in the life sciences also will be addressed in a formal session with extensive opportunity for questions.

The needs, challenges, and satisfaction of teaching science will be addressed by Ms. Donna Oliver, 1987 National Teacher of the Year, current high school biology teacher at Cummings High School, Burlington, N.C. NCSU's scholarship program for students pursuing degrees in science-teacher education also will be explained.

PHILOSOPHY AND ETHICS OF SCIENCE ACTIVITIES

All the activities summarized under Workshop Objective Two fall into the category of philosophy and ethics of science as our purpose is helping participants understand the role of the life sciences in today's society and the role of life science teachers and researchers in resolving contemporary and future problems. In addition to the constant "weaving" of ethics into daily discussions and activities, Dr. Erin Malloy-Hanley will formally present the discipline of ethics including how and why it applies to daily thought and activity. She will develop reasonable "ethical dilemmas" for students to discuss in groups, arrive at a consensus and a justification of opinion.

FOLLOW UP ACTIVITIES

At the beginning of the workshop, students will be given a "pre-test" on the scientific methods, ethics, career opportunities, and nature and role of science (major topics of the workshop). At the end of the workshop, they will be given a "post-test" on the subject matter as well as their satisfaction with workshop activities. This information will be used in planning and conducting the 1990 workshop.

The project director also will visit each participant in his/her high school science class during the 1989-1990 academic year. She will seek to address the entire class on the subject matter emphasized in the summer workshop. This activity furthers helpful relationships with high school science teachers and counselors as well. With the assistance of a professionally-designed evaluation instrument, she will seek to quantify the workshop participant's behavioral changes in the following areas:

1) curriculum choices, i.e., increased emphasis on science and mathematics courses;
2) improvement in overall grade point average;
3) (increased) participation in the high school science club;
4) participation in local and/or state science fairs;
5) summer employment in scientific disciplines/areas;
6) participation in other summer science programs;
7) mastery of the material covered during the summer workshop.

PROJECT SETTING

This 3-week residential workshop will take place primarily on the campus of North Carolina State University (NCSU) at Raleigh as a function of the College of Agriculture and Life Sciences (CALS). CALS consists of 22 departments and 11 interdisciplinary programs. It is ranked among the top ten colleges granting postbaccalaureate degrees in the U.S. In addition to the classrooms and laboratories that will be used during the workshop, participants will reside in air-conditioned dormitories, have meals in a University dining hall, become acquainted with the University library, and use the gymnasium and attendant recreational facilities.

TARGET POPULATION

We will seek to recruit students who may be considered "slight under-achievers", that is, who are recognized as serious, sincere, and hard working but generally receive "B" grades and consequently may not realize their potential as college candidates with opportunities for careers in science. We feel that the very qualities that separate these students from "recognized high achievers" are the same qualities that can contribute to their success in life and in science. Also, we will emphasize recruitment of women and minorities. Disabled individuals will also be welcome as NCSU provides various services for the handicapped.

PARTICIPANT IDENTIFICATION, RECRUITMENT AND SELECTION

Students will be recruited through the NCSU-College of Agriculture and Life Science (CALS) Teachers Advisory Board. This group of 18 high school science teachers from throughout North Carolina serve as a link between the University and high school science classes. The Board meets at NCSU, quarterly, on weekends, to learn of new research findings presented by scientists, and by studying Research Perspectives, a quarterly magazine published by the N.C. Agricultural Research Service describing current research efforts in CALS. The science teachers develop lesson plans and student activities based on the topic(s) presented. The magazine and lesson plans then are sent to the 2194 high school science teachers in NC.

The workshop will be explained to the Board at its spring meeting. Flyers and application guidelines will be given to them for distribution and use in their own and area high schools. (Date of NSF award announcement will preclude announcing the workshop in the magazine for 1989 but the 1989 workshop can be featured in a later issue along with announcement of the 1990 workshop.)

Each teacher will be asked to nominate 5-6 rising 9th and 10th grade students from their high school or neighboring high schools, thereby seeking statewide representation of participants.

We will seek a final workshop enrollment of 40 students. They will be selected on the basis of three application items:

1) an original essay (2-5 pp.) explaining his/her career objectives and why he/she should be selected;

2) two letters of recommendation by academic personnel (either two science teachers or one science teacher and a counselor; and

3) high school performance based on original high school transcripts.

Final selection will be based on the ideal of having an approximately equal number of rising 9th graders and rising 10th graders who demonstrate most potential to benefit from the workshop especially regarding pursuit of college experiences and potential careers in the life sciences.

PROJECT STAFF

Vitae of Principal Investigators Blanche C. Haning and Marianne N. Feaver are given in the appendix. Their brief biographical sketches as well as those of the workshop leaders and residence hall director are summarized below. Brief statements on some of the NCSU faculty and other professionals who have agreed to give their time and share their expertise for the success of this workshop also are given.

Blanche C. Haning, P.I., has coordinated the interdisciplinary curriculum in Integrated Pest Management (IPM) at NCSU since 1977. She originated 10 courses including two options for graduate study in IPM. In addition to advising IPM majors, she advises more than 60 students in the College of Agriculture and Life Sciences. She gives numerous guest lectures each year, coordinates the North Carolina Collegiate Academy of Science Lecture Program,

and frequently is invited to speak to high school groups on careers in the life sciences including their applications in the areas of agriculture. She served as a member of The North Carolina Consortium for Minorities and Women in Mathematics and Science, The NCSU Committee on Ethics in the Professions and Workplace. She attended a Faculty Training Workshop on Systems Approaches to Food and Agriculture Problems, is senior author and producer of a 16mm recruitment film "Healthy Plants-Our Future" developed for the American Phytopathological Society where she has chaired several committees. In 1986, she helped judge research projects completed by 7th and 8th grade students in the N.C. Junior Academy of Science state competition. In summer 1987, she conducted a "Careers in Agricultural Science" workshop for 22 students. She organized and advises the IPM student club. She is an Associate Professor of Plant Pathology and Entomology at NCSU, teaches several courses in these subjects, and in fall 1988, will lecture a section of General Biology for 60-80 students.

Marianne N. Feaver, Co. P.I., joined the NCSU Biological Science Faculty in 1979. The Biological Science Program is a rigorous interdisciplinary program that stewards the large and varied introductory biology courses in which more than 1300 students enroll each year. The Program also confers B.S. degrees in Biological Science. Dr. Feaver teaches the introductory courses: BS100 (General Biology) for science majors and BS105 for non-science majors. She has developed an Honors Section for BS100 and obtained a grant to procure computer software and develop interactive computer exercises for this course. Dr. Feaver's duties include considerable interaction with high school students and teachers through high school science fairs, and representing the College and/or Biological Sciences at career workshops and at regional meetings of the N.C. Academy of Science. She gives guest lectures frequently, including in the Advanced Placement Summer Course for Biology Teachers. She is involved in many public relation projects that require awareness of high school students' concerns regarding careers. She has developed numerous brochures for prospective students in Biological Sciences and Zoology including one specifically designed for minorities. She is a member of the Zoology Department's Committee on Minority Affairs and is active the College AUUP Committee W (women affairs). She is an advisor to the Biology Student Club. She conducts research and interacts with graduate students in the Department of Zoology.

Larry Ray Grimes, Workshop Leader, is an Associate Professor of Biology and Health Sciences at Meredith College, a 4-year college for women, in Raleigh, N.C. Dr. Grimes received his Ph.D. degree in Entomology from NCSU in 1984. He taught in the NCSU Biological Sciences Program while a doctoral degree candidate, serving as a teaching assistant in introductory biology courses for both science majors and nonmajors. He also served as laboratory coordinator responsible for the coordination and preparation of 38 laboratory sections/week during fall 1974-spring 1977. He continues to be active in this program as a Visiting Professor in charge of BS510, Advanced Placement Biology for Secondary School Teachers. His teaching responsibilities at Meredith College include General Biology, Invertebrate Zoology, Comparative Vertebrate Anatomy, and Parasitology. He is very active in extracurricular activities, serving as advisor to the Barber Science Club, Manager of the Meredith College greenhouse, and the department's microscopes. He is co-director of the North Carolina Student Academy (District 4) for high school students and has conducted various field trips for this group as well as Meredith's

students. He has published several papers in entomological and parasitological journals.

C. Michael Williams, Workshop Leader, will receive his Ph. D. degree in Nutrition in August 1988. He has served as instructor and laboratory coordinator in the Biological Sciences Teaching Program at NCSU since 1977. He supervises a staff that includes 20-26 graduate teaching assistants, several work study undergraduate students and a teaching technician in the weekly planning, preparation, and conduct of laboratory sections (approx. 60 and 40 sections/week in the fall and spring semesters, respectively) in the biological science courses. Since 1980, he has served as co-instructor of an annual 5-Week Summer Institute for Advanced Placement Biology Teachers sponsored by the NCSU-College of Agriculture and Life Sciences and the North Carolina Department of Public Instruction. During fall 1988, Mr. Williams will co-instruct BS 292, Special Topics in the Life Sciences.

Charles Collins, Residence Hall Director, is a science teacher in the "gifted and talented" program at Ligon High School, a magnet school, in Raleigh, N.C. In 1987, he served as resident director for the NCSU Upward Bound Summer Program. He served as Instrumental Enrichment Coordinator while participating in the 1987 Research Triangle Consortium (RTC) Summer Enrichment Program conducted at St. Augustine College. (Both programs are pre-college programs for students in high schools and middle schools, respectively.). He serves as a mathematics and science tutor in his home town of Garner, N.C., and is lead advisor of the RTC-Pre-college Program at Ligon High School. Mr. Collins received his B.S. degree in mathematics from North Carolina Central University with a minor in physics. He currently is a candidate for the M.S. degree in Mathematics and Science Education at NCSU.

Barbara Grimes, Coastal Field Trip Director, received her Ph.D. in Zoology with a minor in Microbiology from NCSU in 1983. She has taught such courses as Vertebrate Physiology, Basic Anatomy and Physiology, Invertebrate Zoology, Biology, and Protozoology at NCSU, North Carolina Central University (Durham, NC), and at Meredith College, Raleigh. She currently is a Visiting Assistant Professor of Zoology at NCSU. In 1986 and 1987, she taught General Zoology for 130 students including nonmajors, and Cellular and Animal Physiology Laboratory for 160 students. She has received numerous awards and grants, conducted research at several U.S. and foreign biology stations, published numerous papers, has proficiency in several skills as videomicroscopy, light microscopy photography, organism culture techniques, scanning and electron microscopy. During summers 1981 and 1982, she led the NCSU-sponsored Advanced Placement Biology Course for High School Teachers to coastal N.C. to study aquatic life, and is highly recommended for this workshop field trip.

Erin K. Malloy-Hanley, Ethics Instructor, received her Ph.D. in Philosophy of Religion and Ethics at McGill University in 1973. She has taught such courses as Theological Anthropology, Perspectives on Women in the Christian Tradition, Liberation Theology, Ethics and Medicine, Human Values and the Environment, Values and Education, Ethics, Philosophy of Religion and Business Ethics at McGill University, Concordia University (Montreal), Boston College, Dunbarton College (Washington D.C.), Academy of the Holy Cross (Maryland) and St. Mary's College (Indiana). She currently is Lecturer in the Division of University Studies, NCSU, where she teaches Science and Civilization, Environmental

Ethics, and Dimensions of Progress. She is an acclaimed lecturer and writer, and during 1987-1988, chaired the NCSU Symposium on Ethics in the Professions and Workplace.

Rebecca Leonard, Communications Expert, received her Ph.D. in Communication from Purdue University in 1976. She conducts workshops and seminars on communication skills for businesses, industry, government and professional associations on topics as listening skills, assertive communication, communication with difficult people, and nonverbal communication. She currently is Associate Professor of Speech Communication at NCSU. She was selected Outstanding Teacher, Department of Speech Communication in 1985, and Outstanding Teacher at NCSU in 1979.

John M. Riddle, Historian, received his Ph.D. in History at the University of North Carolina (Chapel Hill) in 1963 and did post-doctoral studies at Universitat, Bonn. He has received many grants and awards for his scholarship including, in 1987, the prestigious George Urdang Medal by the American Institute of the History of Pharmacy. Dr. Riddle is the third American to receive this international honor. He recently was elected President of the Society for Ancient Medicine. From 1982-1988, he served as Head of the Division of University Studies, NCSU and is Director of The Jefferson Scholars Program in which exceptionally-qualified students acquire degrees from both The College of Agriculture and Life Sciences and The College of Social Sciences and Humanities.

Women in Science: Dr. Elizabeth Theil, Professor of Biochemistry at NCSU and recipient of the O. Max Gardner Award by the University of North Carolina (UNC) Board of Trustees in 1988. This is the highest honor the UNC system bestows on a faculty member for outstanding contributions to the human race. She was the first scientist to isolate ferritin from red blood cells. She discovered how ferritin stores iron and releases it when needed. Such information is valuable as iron deficiency or excess are estimated to affect seriously one billion people worldwide. She recently discovered that a segment of messenger RNA, previously an unknown function, actually serves a critical role in controlling translation of genetic information into proteins. She has served as Director of the NCSU Honors Council, chaired the University Research Committee, has authored over 100 scholarly publications, and received the NCSU Alumni Association's Outstanding Research Award.

Minorities in Science: Dr. Lawrence M. Clark is Professor of Mathematics Education and Associate Provost in charge of Affirmative Action at NCSU. He is very active in intervention and pre-college programs for minority students and, from 1985-1987, chaired the North Carolina Conference on Issues and Concerns regarding Female and Minority Enrollment in Mathematics and Science.

Careers in the Life Sciences: Dr. Charles F. Lytle is Professor of Zoology and Coordinator of the Interdisciplinary Biological Sciences Teaching Program at NCSU. He is an active member of numerous professional and civic societies, served as advisor to the North Carolina Junior Academy of Science, and is senior author of two laboratory guidebooks in biology and zoology.

Preparation for College: Ms. Martha B. Moore is Director of the Office of Advising and Placement in NCSU's College of Agriculture and Life Sciences.

She represents the College at numerous high school career functions, works closely with undergraduates and advisors in the College regarding advising activities, internships, and temporary and permanent job placement of students. She plays a major role in ALS 103, Introductory Topics in Agriculture and Life Sciences, a required course for all freshmen students.

Workshop and participant evaluation instruments will be developed in conjunction with Sarah B. Berenson, Director of the Center for Research in Mathematics and Science Education at NCSU. She received her Ph.D. in Mathematics Education/Computer Education from the Florida State University in 1985. She has been very instrumental in curriculum and instruction design for many schools/colleges/agencies, has published extensively, received numerous grants in support of her research, and is very dedicated to pre-college programs.

On Local Resource Problems Facing North Carolinians: Mr. Robert W. "Bill" Hollman, graduate of the NCSU Biological Sciences Program, is a lobbyist for the Conservation Council of North Carolina and the North Carolina Chapter of the Sierra Club. He is rated 6th in effectiveness by the N.C. legislature. Mr. Hollman is an active, knowledgeable, and effective spokesman on numerous environmental issues.

PROJECT SITE (resources and equipment)

Most of the daily activities: discussions, computer exercises, and lectures will take place in lecture halls and laboratories associated with NCSU's Interdepartmental Program in Biological Sciences. These are equipped with blackboards, slide and film projectors, screens, microscopes, video players, preserved specimens, and three Apple IIe computers.

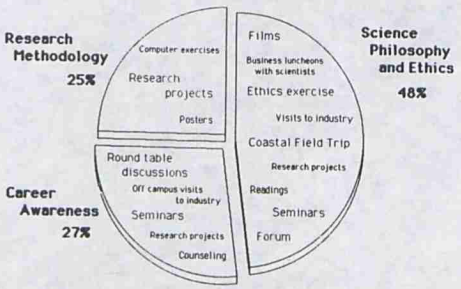
Students also will have use of appropriate equipment and materials in the various NCSU laboratories in which they will conduct their research projects. Small competitive grants will be provided to the faculty to purchase materials, etc., that students will need for their projects.
NCSU faculty have a good reputation for helping in projects as this, and many will be invited to participate in various workshop events where their expertise is judged helpful. Dr. Haning has coordinated an interdisciplinary academic program at NCSU for 11 years, has considerable experience in soliciting assistance and providing a team approach to instruction from both on and off the NCSU campus.

Transportation will be accomplished by use of 15-passenger vans available through the NCSU Motor Pool and driven by individuals having a Class B license.

BUDGET: Major expenses in the budgets for summer 1989 and summer 1990 are salaries and student participant costs. NSF is being asked to bear the burden of participant costs and some student supplies while NCSU is absorbing the larger portion of salaries. NCSU also is providing all the equipment that will be used during the workshop including the purchase of two additional computers (for 1989) and one additional computer (for 1990).

No costs are being asked of student participants.

The distribution of workshop activities according to NSF-designated categories is shown in the graph below.



PROJECT OUTCOMES

As a result of the 1989 NSF National Young Scholars workshop, we hope to:

(1) help students (and the 20 high school science teachers who will be invited to certain parts of the workshop) increase their awareness and understanding of the role and limitations of the scientific method and learn that science research and teaching are human endeavors subject to the abilities, sensitivities, and ethical commitments of the persons involved;

(2) help students understand that all citizens must appreciate the role of science, research scientists and science teachers as part of the whole human paradigm;

(3) increase the number of students who will actively get on-track in their high school programs regarding preparation for college;

(4) increase the number of students already on-track who will take additional courses in science and mathematics;

(5) convince students to take responsibility for their decisions, including selection of high school courses and extra-curricula activities in order to become better prepared to succeed in college and postbacculaureate programs;

(6) increase student awareness of the varied career opportunities both within and allied with the life science disciplines;

(7) convince students that such qualities as determination, resourcefulness and dependability are important to success in college, in careers, as public servants, and citizens;

(8) help students improve their communication skills (following a lecture on this topic) through extensive opportunity for oral presentations and discussion, and by using computers and cameras to refine their talks and final posters;

(9) provide an educational and enjoyable pre-college experience for 40 students who might otherwise not have such an opportunity.

References and Other Resources

Below are listed books, pamphlets, films and computer programs that will be available to workshop participants as resources. This is not meant to be an inclusive list. We simply wished to provide reviewers with some idea of the resources that will be available for student use. This list will be amended as we better get to know the specific interests, strengths and weaknesses of participants and and staff. Nor will every participant be expected to utilize all resources listed. One student for example may wish to further his/her awareness of career opportunities after the initial round table discussion by using a computer program, another by consulting a text and a third by watching a film. Those resources we expect most participants to use are indicated by an asterisk (*). Several copies of listed texts and other resources will be available for student use throughout the workshop.

Albert Einstein: The Education of a Genius. Videotape. Films for the Humanities and Sciences: Princeton, New Jersey. VHS*

Appleworks 2.0. Computer program. Claris. Apple II.

Are you swimming in a sewer? 1986. Videotape. Nova. VHS*

Barney, G. 1980. The Global 2000 Report to the President: Entering the Twenty-First Century. U. S. Government Printing Office: Washington D. C.*

Bee Cause. Computer program (Scientific Method). Q. E. D. Apple II.

Blazing Paddles. Computer program. Baudville. Apple II.

Calder, N. 1983. Timescale: an Atlas of the Fourth Dimension. Viking Press: New York, New York.

Career focus. Computer program. Random House Media. Apple II.

Carson. R. 1962. Silent Spring. Fawcett Crest Books: Greenwich, Conn.

Characteristics of a Scientist. Computer program. Cygnus. Apple II.

Cricket Graph. Computer program. Cricket. Macintosh.*

Computereyes. Video digitizing interface and software. Digital vision. Apple II.

Collingridge, D. and C. Reeve. 1986. Science speaks to Power. St. Martin's Press: New York, New York.

Commoner, B. 1966. Science and Survival. The Viking Press:New York, New York.

Coulter, K. J., M. Stanton and A. D. Goecker. 1985. Employment Opportunities for College Graduates in the Food and Agricultural Sciences: Agriculture, Natural resources and Veterinary Medicine. Higher Education Programs, Office of Grants and Programs Systems, U. S. Dept. of Agriculture: Washington, D. C.*

Coulombe, D. A. 1984. The Seaside Naturalist: A Guide to Nature Study at the Seashore. Prentice

Hall: Englewood Cliffs, New Jersey.*

Dazzle Draw. Computer program. Broderbund. Apple II.

Easy Graph. Computer program. Grolier. Apple II.

Ehrlich, P. 1978. 2nd ed. The Population Bomb. Ballantine Books: New York, New York.

Ehrlich, P. and A. Ehrlich. 1974. The End of Affluence. Ballantine Books: New York, New York.

Fantavision. Computer program. Broderbund. Apple II.

Gaia Books Limited. 1984. Gaia, An Atlas of Planet Management. Anchor Press/Doubleday: Garner City, New York.

Genetic Engineering: Prospects of the Future. Videotape. HRM VHS*

Golffarb, T. D. ed. 1987. Taking sides, Clashing Views on Controversial Environmental Issues. Duskin Publishing Group. Guilford, Conn.*

Gould, S. J. 1981. The Mismeasure of Man. W. W. Norton, New York.*

Gornick, V. 1983. Women in Science: Portraits from a World in Transition. Simon and Schuster: New York, New York.

Healthy Plants-Our Future. Film. Amer. Phytopathological Soc. 16mm.

High Tech Babies. Videotape. Nova VHS*

Land the Issues: Serious Problems with Difficult Solutions. Slide-Tape set. Projected Learning Programs.*

Levine, C. ed. 1984. Taking Sides: Clashing Views on Controversial Bioethical Issues. Dushkin Publishing Group: Guilford, Conn.

Janovy, J. 1985. On Becoming a Biologist. Harper and Row: New York, New York.*

Judson, H. F. 1979. The Eighth Day of Creation: Makers of the Revolution in Biology. Simon and Schuster: New York, New York. *

Keller, E. F. 1983. A Feeling for the Organism: the Life and Work of Barbara McClintock. W. H. Freeman: San Francisco, Calif.*

Koala Touch Tablet. Computer graphics tablet and software. Koala. Apple II.

Lyon, L. A. 1980. Guidelines for High School Students on Conducting Research in the Sciences. Moore Publishing Company. Durham, North Carolina.*

MacDraw. Computer program. Claris. Macintosh.*

MacPaint. Computer program. Claris. Macintosh.*

MacWrite. Computer program. Claris. Macintosh.*

Mann, K. W. 1970. Deadline for Survival: A Survey of Moral Issues in Science and Medicine. The Seabury Press: New York.

Meadows, D.; Meadows, D.; Rander, J. and Behrens, W. 1972. The limits to Growth. Potomac Associates: Washington, D. C.

Morowitz, H. J. 1985. Mayonnaise and the Origin of Life: Thoughts of Minds and Molecules. Charles Scribner's Sons: New York.*

Morowitz, H. J. 1987. Cosmic Joy and Local Pain: Musings of a Mystic Scientist. Charles Scribner's Sons: New York.

Oesper, R. E. 1975. The Human Side of Scientists. University Publications, University of Cincinnati: Cincinnati, Ohio.

Oh, Deer. Computer program. Apple II

Notes of a Biology Watcher: A film with Lewis Thomas. 1982. Videotape Nova. 3/4"

Research in Desert Ecology (James Reichman's life). Videotape. EMS. VHS.

Rifkin, J. 1980. Entropy: a New World View. Viking Press: New York, New York.

Statview 512+. Computer program. Brainpower. Macintosh.

Singer, P. and D. Wells. 1984. The Reproduction Revolution, New Ways of Making Babies. University Press: Oxford, London.

Stephen J. Gould. This view of life. Videotape. Nova. VHS.*

Test Tube Babies. 1982. Videotape. Nova. 3/4"*

Tribbles. Computer program. COMPress. Apple II.*

The Genetic Gamble. Videotape. Nova. VHS.

The Print Shop. Computer program. Broderbund. Apple II.

The Rise of a Wonder drug (Alexander Fleming's+ associates' story). Videotape. Nova. VHS.*

The Scientific Method. Computer program. Cygnus. Apple II.*

The toxic trial 1986. Videotape. NOVA. VHS. *

Turk, J. 1985. Introduction to Environmental Studies. 2nd. ed. Saunders: New York, New York.*

Vetter, B. M. 1984. Opportunities in Science and Engineering: A Chartbook Presentation. 2nd. ed. Scientific Manpower Commission: Washington. D. C.*

Watson, J. D. 1980. The Double Helix: a Personal Account of the Discovery of the Structure of DNA. Norton: New York, New York.

Walters, W. A. and P. Singer. 1982. Test-tube Babies: A Guide to Moral Questions, Present Techniques and Future Possibilities. Oxford University Press: London.

Wilson, K. 1986. Systems Approaches to Food, Agriculture and Natural Resources Problems.

Writing Scientific papers. Computer program. SIMPAC. Apple II.

BLANCHE C. HANING

BIRTH DATE/PLACE: March 7, 1943 Paxton, MA

EDUCATION:

The University of Massachusetts	B.S. (Botany)	1965
Iowa State University	M.S. (Plant Pathology)	1967
Iowa State University	Ph.D. (Plant Pathology)	1970

PROFESSIONAL EMPLOYMENT:

1970-1974	Research Associate, DEKALB AgResearch, Inc., DeKalb, IL.
1974-1975	Adjunct Assistant Professor of Biology, North Illinois University, DeKalb
1975-1976	Assistant Professor of Biology, Northern Illinois University, DeKalb
1976	Adjunct Assistant Professor of Plant Pathology (Study Leave, Spring Term), N. C. State University, Raleigh.
1977-present	Associate Professor of Plant Pathology and Entomology; Coordinator, Academic Programs, Integrated Pest Management, North Carolina State University, Raleigh.

PROFESSIONAL RESPONSIBILITIES: 100% Academic Affairs

Instruction in and administration of the academic program in Integrated Pest Management (IPM), including IPM student advising.

PROFESSIONAL SOCIETIES:

Membership

American Phytopathological Society (APS)
International Society of Plant Pathology (ISPP)
North Carolina Association of Nematologists and Plant Pathologists (NCPPN)
Gamma Sigma Delta
Entomological Society of America (ESA)
National Association of Colleges and Teachers of Agriculture (NACTA)
American Association for the Advancement of Science (AAAS)

Committee Membership/Offices:

APS Teaching Committee 1978-present, V. Chm. 1979-80, Chm. 1983-84.
APS-IPM Committee, Chm. 1980-81, 1981-82, IPC 1982-83.
NACTA E. B. Knight Journal Award Committee 1982-83,1983-84.
APS-Special Committee on IPM, 1979-80.
Adhoc Committee on Women and Minorities, 1979-80.
APS - Adhoc Committee for the Study of a Professional Doctoral Degree in Plant Health, 1983-84.
APS - Public Relations Committee, 1986-87.

HONORS AND AWARDS:

Outstanding Young Women of America, 1979
American Men and Women in Science, 1979
Who's Who in Technology Today, 1980

HONOR SOCIETY:

Gamma Sigma Delta

COMMITTEES

Department:

Member Committee on Curriculum and Academic Advising 1978-present.

School:

Teaching Improvement Committee 1978-79
Advisory Committee For the External Learning Experience 1979-80, 1980-81, 1981-82
University Day 1978 - present
Advisory Committee for Interdisciplinary Ecology Program 1979-80, 1980-81
Ecology Executive Committee 1981-82, 1982-83
Curriculum Committee 1980-81, 1981-82, 1982-83, 1983-84.
BioSci Graduation Committee, 1977 -present.
Extension IPM Advisory Committee, 1979-80, 1980-81, 1981-82
IPM Teaching Subcommittee, Chm. 1977-present
NC First Alternative Farming Field Day, 1986

University:

University Courses and Curriculum Committee 1978-79, 1979-80, 1980-81, 1981-82
Provost Forum Discussion Group on Interdisciplinary Activities at NCSU, Chm. 1979-80
Steering Committee on Issues and Concerns in Mathematics and Science Education with Emphasis on Minorities and Women, 1984-present

National:

National Constraints Work Group of the Office of Technology Assessment (OTA) on Pest Management Strategies in Food Production 1978-79, 1979-80
First FAculty Workshop on Systems Approaches to Food and Agriculture Problems, Ft. Collins, CO. 1986.

Vita

Name: Marianne Niedzlek Feever

Title: Associate Professor, Department of Zoology, NCSU

Born: March 31, 1947: Chicago, Illinois

Higher Education:

B. S.	University of Illinois (CC)	1969
M. S.	University of Illinois (CC)	1971
Ph. D.	University of Michigan	1977

Professional Positions Held:

1978	Wastenaw Community College	Instructor
1978 - 1979	University of Michigan	Lecturer
1979 - 1986	North Carolina State University	Assistant Professor
1986 - present	North Carolina State University	Associate Professor

Relevant Experience:

Teaching:

Six different course for **undergraduates** including:
Anatomy and Physiology, Genetics, Ecology, Introductory Biology for Science and Non-Science Majors, and Honors Introductory Biology.

Graduate courses in Evolutionary Ecology, including present Seminar in Ecology that will consist of 4 workshops to introduce graduate students to new methodology and thinking in areas not well represented among the Zoology faculty.

Research: Behavioral Ecologist

Invited speaker to Symposium on Mating Systems in Orthoptera, Chapter in text resulting from Symposium, 5 published or submitted papers, two awarded poster papers.

Other:

Judge, High School, Junior High School Science Fairs, and the Academy of Sciences Sponsered, High School Science Project Competitions
Reviewer of candidate folders and interviewer of finalists for Cauldwell Scholarships (a NCSU Scholarship program for entering freshmen).
Speaker at High School Career Fairs on career opportunities in Biological Sciences
Guest lecturer in the AP Biology Course for Teachers
Recipient of Grant for Enhancing Computer Classroom Instruction to add interactive computer exercises to the Honors Introductory Biology section
Producer of several PR pamplets for the Biological Science Program, that focused on the positions held by former graduates and so, the varied and diverse career opportunitaies available for Life Science Degree recipients
Member of Zoology's Minority Affairs Committee that published a special pamplet to recruit minorities into the department
Member of NCSU's AUUP Committe W (Womens' Affairs Committe)

AGRICULTURAL
EXTENSION
SERVICE

North Carolina State University
College of Agriculture and Life Sciences

1988-89

Agricultural Extension Service
Office of the Director
Box 7607, Raleigh, NC 27695-7607

December 20, 1988

Dr. Lawrence Clark
Associate Provost
Box 7101
Holliday Hall
NCSU
Campus

Dear Dr. Clark:

Thank you so very much for the outstanding official remarks given to the new Extension workers during the State Orientation Conference banquet on December 5. You certainly made them feel good as field faculty of North Carolina State University. You challenged and stimulated them. Your support for the North Carolina Agricultural Extension workers is greatly appreciated.

Best wishes for a prosperous new year.

Sincerely,

Bernadette G. Watts

Bernadette G. Watts
Extnesion Specialist-
Educational Program

BGW/pm

AGRICULTURAL
EXTENSION
SERVICE

North Carolina State University
College of Agriculture and Life Sciences

Agricultural Extension Service
Office of the Director
Box 7602
Raleigh, N. C. 27695-7602

October 2, 1989

TO: Environmental Scan Group

FROM: Chester D. Black, Associate Dean and Director

RE: Environmental Scan of Trends and Emerging Issues - Phase II

You have been selected to review the trends and issues identified in Phase I of our Environmental Scan. Based on survey results from Phase I, we have consolidated the responses into a shortened (most frequently indicated) list of trends and emerging issues.

In part I of this questionnaire, please review this list of trends/issues and rank order them from 1 to 25 (1 is the most important) that the N. C. Agricultural Extension Service should consider as we initiate our strategic planning process.

In part II, we are asking you to list your top three trends/issues and to suggest a possible resource person for each trend/issue who is knowledgeable of this subject matter and could provide projections that will help Extension be more effective in planning for the future.

Please complete the enclosed questionnaire and return as soon as possible (before October 13, 1989) in the enclosed envelope.

Thank you in advance for your assistance in this endeavor.

Enclosure

N. C. AGRICULTURAL EXTENSION SERVICE
ENVIRONMENTAL SCAN - PHASE II

I. Please review this list of trends and emerging issues and rank order them from 1 to 25 (1 is the most important) that the N. C. Agricultural Extension Service should consider as we initiate a strategic planning process:

(Trends/emerging issues help define the external environment in which we must operate, but do not necessarily dictate a specific program response.)

Rank

____ Increasing numbers of youth at risk of social and health problems

____ Changing structure, economic and social conditions of N. C. families

____ Increasing numbers of elderly, especially in rural areas

____ Lack of adequate child care facilities and parent education

____ Declining health and well being of N. C. families

____ Inadequate leadership skills of elected officials, community leaders, and youth to meet future challenges.

____ Declining ability of families to manage resources

____ Increasing rates of rural poverty

____ Increasing illiteracy rates and citizens without minimum skills for gainful employment

____ Deteriorating race and ethnic relations and progress in employment, housing and education

____ Expanding partnerships between the public and private sectors

____ Declining availability of U. S. graduates in hard sciences and engineering

____ Adopting new and innovative information delivery systems by the NCAES

____ Sustaining profitable production of food, fiber and forest products in an environmentally sound setting

____ Growing importance of environmental concerns and regulations on farmers, rural communities, towns and cities.

____ Providing a safe and nutritional food supply to the consumer

____ Improving the competitiveness of N. C. agriculture in the world economy

____ Maintaining adequate water quality and quantity

____ Lack of alternative sources of employment in rural areas

___ Enhancing income from agriculture and agriculture-related businesses through diversification, alternative agricultural opportunities, and value-added production

___ Managing animal, municipal, and solid waste in an environmentally sound manner.

___ Changing structure of N. C. agriculture (size of farms, production systems, age, and race of owner/operators)

___ Changing policies relating to food, environment, agricultural production, and marketing.

___ Maintaining the natural resource base for economic, esthetic and recreational use

___ Maintaining a suitable infrastructure in rural areas (transportation, utilities, and protection services)

II. Your assistance is also needed in identifying resource people for a Futuring Panel. The purpose of the panel is to provide projections that will help Extension be more effective in planning for the future. The panel will use their knowledge of trends and projections to describe conditions that have the possibility of existing in the future. These would be conditions that affect the quality of life for the citizens of North Carolina and (in a broader sense) the world. "Futurists" with expertise in relevant futuring or scanning categories are needed on the panel.

From Part I above, please list your top three trends & emerging issues and a possible resource person to serve on an Extension Futuring Panel.

	TREND/ISSUE	RESOURCE PERSON NAME, ADDRESS/AFFILIATION, PHONE
1.	_____	_____
	_____	_____
	_____	_____
2.	_____	_____
	_____	_____
	_____	_____
3.	_____	_____
	_____	_____
	_____	_____

Thank you for your time and assistance! Please return by October 13, 1989.

ENVIRONMENTAL SCAN
SUB-COMMITTEE
BOX 7604
NCSU
RALEIGH NC 27695-7604

North Carolina State University

File

Office of the Dean
Box 7601
Raleigh, NC 27695-7601
919-737-2668

College of Agriculture and Life Sciences
Academic Affairs, Extension & Research

May 18, 1989

TO: Associate Provost Lawrence M. Clark

FROM: D. F. Bateman, Dean

SUBJECT: Change in Title/Dr. Ernest Hodgson

As you know from our prior discussion CALS has been authorized to establish a Department of Toxicology effective July 1, 1989. We have had a Toxicology Program for more than 20 years. Dr. Ernest Hodgson, William Neal Reynolds Professor, is currently Chairman of the Toxicology Program.

The new Department of Toxicology will consist initially of the core toxicology group now in the Department of Entomology, their students and staff plus Dr. Jack Sheets and the staff of the Pesticide Residue Research Laboratory. This new Department will be housed in the current facilities which house the faculty involved. The Toxicology Program which awards graduate degrees will remain, for the time being, an interdepartmental program and Dr. Hodgson will remain Chairman of this Program.

After talking with Provost Winstead and you, we are taking steps to change Dr. Hodgson's title to William Neal Reynolds Professor and Head, Department of Toxicology and Chairman of the Toxicology Program effective July 1, 1989. This change in title broadens Dr. Hodgson's responsibilities which includes the headship of the new Department.

We are indeed pleased about establishing the Department of Toxicology and look forward to Dr. Hodgson's leadership as we seek to further develop this area on campus. If any further information is needed about this title change please let me know.

DFB/dv
cc: Provost N. Winstead

Ag & Life Sciences

North Carolina State University

Box 7101, Raleigh, N. C. 27695-7101

Office of the Provost
and Vice Chancellor

December 7, 1988

MEMORANDUM

TO: Dr. Paul Agris

FROM: N. N. Winstead Nash Winstead

SUBJECT: Your Memo of December 2, 1988

Your memo is as I remember our discussion except for some deviation on two points. First, I did not set a support figure in dollars from ALS as a minimum. I can see how that could vary from department to department. I also feel that it is important to move support for new black faculty into a similar model as that for other faculty in a specific department, as quickly as possible.

Secondly, I do want you to continue searching within the four areas for black candidates. I don't want us to give up yet. At the same time, if we can come up with the black presence in Biochemistry via positions such as we discussed, I will consider giving up on the final of the four positions.

NNW/cc

cc: Dr. Larry Clark ✓

North Carolina State University

Department of Biochemistry
College of Agriculture and Life Sciences
College of Physical and Mathematical Sciences

Box 7622
Raleigh, NC 27695-7622
(919) 737-2581

December 2, 1988

W

Dr. Nash N. Winstead
Provost and Vice Chancellor
109 Holladay Hall, Box 7101
NCSU Campus

Dear Nash:

Thank you very much for speaking to me about Biochemistry's program of minority recruitment. As I had said, we've denoted our program as aggressive affirmative action. We are not only actively pursuing the candidacy of the recognized minority applicants but, through contacts at other universities and at NIH, are receiving leads on potential candidates. I believe we are the only department, or one of very few, that is fully documenting personal candidate data by return mail request for information using the enclosed form. The response has been large, and the data should be very informative.

I do sincerely appreciate your support of our efforts to enhance Biochemistry to the status of an internationally recognized, nationally ranked top-rated department.

To insure there is mutual understanding about our meeting, I'd like to communicate what I felt had been concluded. I believe I'm correct in saying that Chancellor Poulton and you have recognized that Biochemistry has established long-term research and teaching goals, and that within these goals are four specific areas of faculty expertise that will be promoted. These selected four areas, which by the way are now supported by the recent CSRS review of Biochemistry, are: plant biochemistry and molecular biology; biophysical structure of nucleic acids and proteins; bioinorganic chemistry; and control of transcription and translation. The Chancellor and you, I believe, also recognize that, although we have found quality minority candidates within our 300 applicants, none are within the four areas of excellence for which we want to be recognized.

Therefore, I understand that, in our pursuit of minority candidates for Biochemistry, possibly in conjunction with one or more CALS departments, for offers to minority candidates outside our stated four areas, you are willing to provide competitive nine month salaries. These are additional positions to Biochemistry that would not jeopardize, or in any way affect the support already established for

the four positions we now have open. I recognize that this is not a commitment of positions, at least not until we have a candidate to whom to offer a position, and that I would need to pursue three months salary and set-up funds from CALS in order to make such positions equivalent to others we now have. All Biochemistry faculty have 12 month appointments, and all new positions have a guaranteed minimum of $50,000 in set-up funds.

If I've misunderstood some part of our conversation, your help in clarifying it would be beneficial. I greatly appreciate the kind of support demonstrated by this offer once an individual is found.

Sincerely,

Paul F. Agris, Head
Department of Biochemistry

Enclosure

cc: Chancellor Bruce R. Poulton

POSITION NUMBER:

PERSONAL DATA ON
BIOCHEMISTRY DEPARTMENT APPLICANT

The NCSU Biochemistry Department has a continuing commitment to monitoring the operation of its position review and position award processes to detect and deal appropriately with any instances of real or apparent inequities with respect to age, sex, race, or ethnicity of the applicant.

To provide us with the information the Department needs for this important task, the applicant is requested to complete the form below and return it to: Joan Johnson, Equal Opportunity Program, Biochemistry Department, NCSU Box 7622, Raleigh, NC 27695. An addressed return envelope is included.

This form is not part of your application. It will NOT be duplicated and will NOT be a part of the review process. Data will be confidential. All analyses conducted on the data will report aggregate statistical findings only and will not identify individuals.

ALL RESPONSES ARE VOLUNTARY.

If you decline to provide this information, it will in no way affect consideration of your application.

Your cooperation will be appreciated.

DATE OF BIRTH *(month/day/year)*	SEX
	☐ Female ☐ Male

RACE AND/OR ETHNIC ORIGIN *(check one)*

☐ American Indian or Alaskan Native

☐ Asian or Pacific Islander

☐ Black, not of Hispanic origin

☐ Hispanic

☐ White, not of Hispanic origin

NOTE: The category that most closely reflects the individual's recognition in the community should be used for purposes of reporting mixed racial and/or ethnic origins. Definitions are as follows:

American Indian or Alaskan Native: A person having origins in any of the original peoples of North America, and who maintains cultural identification through tribal affiliation or community recognition.

Asian or Pacific Islander: A person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands. This area includes, for example, China, India, Japan, Korea, the Philippine Islands and Samoa.

Black, not of Hispanic origin: A person having origins in any of the black racial groups of Africa.

Hispanic: A person of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish culture or origin, regardless of race.

White, not of Hispanic origin: A person having origins in any of the original peoples of Europe, North Africa, or the Middle East.

DEPARTMENT OF ZOOLOGY
NORTH CAROLINA STATE UNIVERSITY

PHONE 737-2741
Campus Box 7617
Raleigh, N.C.
27695-7617

June 28, 1988 Date

TO: Dr. Lawrence Clark

FROM: Bill Grant

Larry,

Here's the proposal that I plan to give to Jim Oblinger. I would appreciate your suggestions, especially about the budget (pp. 4-5).

Thanks.

Ag. & Life Sciences

North Carolina State University

College of Agriculture and Life Sciences
Academic Affairs, Extension & Research

Academic Affairs
Office of the Director
Box 7601, Raleigh 27695-7601
(919) 737-2614

June 29, 1988

MEMORANDUM

TO: Dr. J.L. Oblinger

FROM: W.C. Grant

SUBJECT: Proposed Retention Activities for African-American Students in the College of Agriculture and Life Sciences

The attachment indicates proposed retention efforts for 1988-89. Ms. Barbara Terry will assist in planning and conducting these activities. However, an additional teaching assistant is recommended for tutorial services in biology.

I believe that the students would benefit greatly from the proposed activities.

Enclosure

cc: Ms. Barbara A. Terry

PROPOSED RETENTION ACTIVITIES FOR THE COLLEGE OF AGRICULTURE AND LIFE SCIENCES FOR ACADEMIC YEAR 1988-89

Introduction

Three principal factors detract from the academic success of African-American students at North Carolina State University (NCSU):

1. Low self-esteem or lack of self-confidence
2. Poor study habits
3. Poor test-taking skills.

To address these factors, we propose several programs and activities. We plan a concentrated effort with African-American freshmen as well as continued work with sophomores, juniors, and seniors as indicated below.

Program for African-American Freshmen in the College of Agriculture and Life Sciences (CALS) for 1988-89

1. This effort will be preceded by consultation with the Admissions Office and the NCSU Academic Skills Program to identify African-American freshmen in CALS who might experience academic difficulty. (High school background, high school class size, and high school records will be considered.)

2. These students will participate in regular CALS workshops on (A) Study techniques and skills and (B) Test-taking skills.

3. After freshmen have taken one test (e.g. in General Biology, General Chemistry, or Mathematics), we will identify students who especially need individual attention.

Tutorials

1. It is recommended that tutorials be established in selected subject areas in CALS (e.g. General Biology) to supplement Learning Center activities and other current efforts.

2. It is recommended that Graduate Teaching Assistants be identified, hired, and trained to conduct the above tutorials.

3. We shall continue to encourage African-American students to participate in tutorials offered by other colleges (e.g. PAMS tutorials in mathematics and chemistry). Similarly, African-American students in other colleges will be invited to participate in CALS tutorials.

Follow-up to African-American Symposium

1. It is recommended that the Provost's Office and the Chancellor's Advisory Council on African-American Affairs sponsor several major post-Symposium activities each year.

2. To supplement the above, it is strongly recommended that one or two major post-Symposium activities be held in each college annually and that African-American students from the other colleges be invited.

3. CALS will conduct one or two major post-Symposium activities as well as other activities that foster self-confidence in African-American students.

CALS African-American Undergraduate Student Organization

1. For several years, the CALS African-American Coordinator has served as faculty advisor to the Preprofessional Health Society (PPHS) and has utilized this organization to maintain contact with African-American students in the college.

2. We anticipate a modification of the name "Preprofessional Health Society" to reflect and emphasize the fact that the organization is for all CALS African-American undergraduate students, not just those who are interested in health careers.

3. Possible activities of the CALS African-American undergradute student organization during 1988-89 include the following:

A. Meetings featuring African-Americans who are recent graduates of CALS programs,

B. Meetings featuring professionals and/or representatives of the following programs:

NCSU Graduate School
NCSU School of Veterinary Medicine
Pharmacy Schools
Physician's Assistant Programs
Physicians and Dentists (possibly in a panel format)
Optometrists
High School Science Teacher(s)
Medical Education Development (MED) Program, UNC-CH School of Medicine
Center for Student Opportunities (CSO), East Carolina University School of Medicine,

C. Meeting featuring Ms. Martha Moore for information on Cooperative Education Programs and Placement Services,

D. Workshops on Time Management and on Study Skills,

E. Meetings featuring selected NCSU African-American Coordinators,

F. Other meetings, based on results of a student poll.

CALS African-American Awards Banquet for Undergraduates

1. It is recommended that a CALS African-American Awards Banquet for undergraduates be instituted, beginning in April 1989.

2. All CALS African-American students and their parents would be invited, along with all CALS administrators and faculty.

3. Categories of awards will be determined in the near future. Among the awards, however, would be those recognizing the greatest academic improvement by an individual in each class.

Resources Needed for 1988-89

A. Database software for student record storage and retrieval
(To be used in a Macintosh Plus computer currently available)

Compile information by class and curriculum.
Monitor for potential academic problems.
Identify and encourage students to apply
to graduate programs of interest.

Price: $330.00

B. Funds for two speakers for CALS Follow-up to African-American Symposium

Honoraria:	2 @ $1250 = $2500
Expenses:	2 persons @ $250 = $500

Honoraria plus expenses: $3000.00

C. Field trips
(Visits to research, educational, medical, and biomedical facilities)

Cost: $900.00

D. CALS African-American Awards Banquet, April 1989

Meals (@ $6.00/person): $1680

Assuming attendance by 90 of 180 students)
90 students
180 parents
10 faculty and administrators
280 persons

Trophies and Plaques: $ 250

Honorarium for Speaker: $ 200

Total for Awards Banquet: $2130.00

E. Salaries of Graduate Teaching Assistants

2 @ $8400 = $16,800

Funds have been allocated for one TA for 1988-89.
An additional TA is needed @ $8400.

Resources Needed for 1988-89

F. Funds for supplies and services

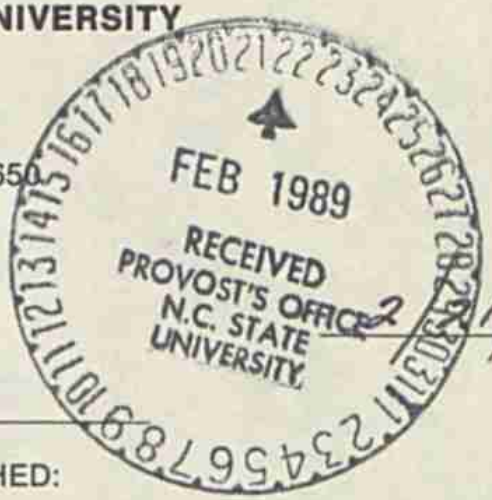
Computer printouts of roster of African-American students
Address labels
Other supplies and services

Amount: $200.00

TOTAL: $23,360*

*Includes $8400 already allocated for one Teaching Assistantship

NORTH CAROLINA STATE UNIVERSITY
Academic Programs
Integrated Pest Management
2705 Bostian Hall, Raleigh, NC 27650
919/737-3341



NCSU

2/1/89 DATE

TO: Larry

ACTION REQUESTED ON ATTACHED:

_____ Note and return

_____ Please handle

_____ For your information (need not return)

_____ Please answer; furnish me copy

I thought it would be good for you to be copied on this. Needless to say, I'm very displeased about this decision.

FROM: Blanche

Ag & Life Sciences

North Carolina State University
School of Agriculture and Life Sciences
Academic Affairs, Extension & Research

Department of Plant Pathology
Box 7616, Raleigh, 27695-7616

21 February 1989

Dr. William L. Klarman, Head
Department of Plant Pathology
Box 7616
North Carolina State University

Dear Dr. Klarman:

I am requesting a written explanation of the Department of Plant Pathology's negative vote on 21 October 1988 on my request for promotion to professor. I hereby am following the recommendation provided under "Promotions in Faculty Rank", NCSU Faculty Handbook (1987) p. 43, regarding resolution of a grievance of this nature.

Sincerely yours,

Blanche C. Haning

Blanche C. Haning
Associate Professor

cc: Dr. Murray S. Downs
Dr. Lawrence M. Clark
Dr. Durward F. Bateman
Dr. James L. Oblinger

CALS Today
COLLEGE OF AGRICULTURE & LIFE SCIENCES
NORTH CAROLINA STATE UNIVERSITY VOL. IV NO. 4 APRIL 1988

College Proposes Four Aquaculture Facilities

Aquaculture is being moved to the front burner by the College of Agriculture and Life Sciences.

Dean Durward F. Bateman calls aquaculture — the cultivation of water — "the most promising new area for agriculture."

"In my judgement, aquaculture can be a $100 million annual business for North Carolina in 10 or 15 years if we manage properly," Bateman added.

CALS has developed a long-range plan to help the state realize this potential. The plan focuses initially on two species: mountain trout, which is already being produced commercially in Western North Carolina, and hybrid striped bass, a new species suited to Eastern North Carolina.

The production of trout is the state's main aquaculture success story so far, grossing mountain farmers about $8 million in 1987. CALS stationed Dr. Jeff Hinshaw at Fletcher two years ago to provide this industry with intensive technological assistance. His work has been described as an "outstanding success." Industry leaders believe trout production could double with sufficient planning and resources.

The hybrid striped bass (HSB) is causing excitment both on and off campus. This new fish, scientists say, has the potential for putting the Coastal Plain on the fish farming map.

The 1987 North Carolina General Assembly provided CALS with $400,000 to help establish HSB as a commercial industry in the state. Additional funds will be sought from the General Assembly as CALS attempts to broaden its aquaculture work to include additional species.

Initial plans call for the development of applied research and demonstration programs directed at HSB production management, reproductive efficiency, harvesting and marketing. This program will be expanded to include catfish and crawfish, as resources become available. A basic research program is also planned. It would focus on such major industry constraints as reproduction and the year-around production of fingerlings.

CALS's aquaculture plan calls for the development of four major facilities:

Trout Aquaculture Research and Extension Laboratory. Located near Fletcher, this facility would include 10 raceways for grow-out experiments and demonstrations and a hatchery to provide fry for research and demonstration needs. The cost: about $290,000. CALS would provide opportunities at the facility for collaborative research with faculty from Western Carolina University and the University of North Carolina at Asheville.

Pamlico Marine Center. Located near Aurora and owned by Texasgulf Chemicals Company, this facility has been leased for many years by East Carolina University for use by the Sea Grant program. Texasgulf has agreed to transfer the facility and 180 acres of land to the Agricultural Foundation at NCSU. CALS proposes to use about $248,000 of the $400,000 received from the 1987 General Assembly to renovate 14 existing ponds, build 25 new ponds, and make other improvements at the center. East Carolina faculty members and other participants in Sea Grant research would be permitted to continue their work at the site.

Tidewater Research Station. Located near Plymouth and owned by the North Carolina Department of Agriculture, this station would become the site of a major aquaculture research and demonstration center. Some $100,000 would be spent at Plymouth to build 16 ponds and other facilities. Four of the ponds would be built specifically for crawfish; 12 would be for finfish.

See related Aquaculture Stories Page 2

Harris Lake. Located near Newhill in southern Wake County and owned by Carolina Power and Light Company as part of its Shearon-Harris nuclear complex, this facility would be home to much of CALS' basic aquaculture research. Proposed there in the immediate future is a $5 million hatchery and pond facility to be built by the North Carolina Wildlife Resources Commission. CALS would contribute $25,000 (from its 1987 appropriation) to this endeavor. However, CALS plans to ask the short session of the General Assembly, which convenes in June, for $539,000 for the construction of 48 research ponds at Harris Lake.

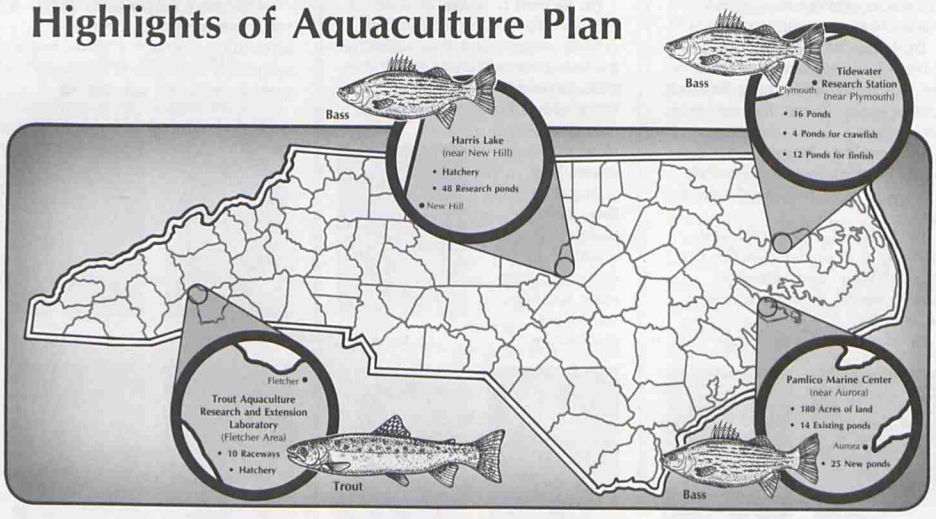
The addition of these three facilities would be accompanied, hopefully, by an expansion of research, extension and support personnel.

Most of CALS's initial work will center on freshwater aquaculture. Work in brackish and saltwater aquaculture, often referred to as mariculture, will increase as the program expands. Among the saltwater species being discussed are shrimp, clams and flounder.

Acquisition of the Pamlico Marine Center will enable CALS to gear up quickly for its work with HSB. That facility will concentrate on saltwater species, however, after the Tidewater Research Station comes on line.

The grow-out ponds that the Agricultural Extension Service will use for demonstration purposes at both Aurora and Plymouth will function much like the Swine Development Center at the Upper Coastal Plain Research Station near Rocky Mount. ■

Highlights of Aquaculture Plan



Hinshaw Blazes Aquaculture Trail

By Tom Byrd

I gave Jeff Hinshaw a call as soon as the Agricultural Extension Service hired him as its first aquaculture specialist on June 1, 1986.

"Tell me about your job, Jeff; I would like to do a story on you and your work," I said.

The call netted me an invitation to visit Jeff in Western North Carolina for an on-the-ground look at how the Extension Service is delivering new technology to the mountain trout industry.

Our first stop was the Tribal Fish Hatchery on the Cherokee Reservation. "I told the hatchery manager I would come by today to help him vaccinate his fish," Jeff explained as we snaked our way up a creek lined with anglers.

"Vaccinate fish?" I said in a voice that clearly revealed my dirt farmer origins.

"Trout need to be vaccinated for a disease called red mouth," Jeff explained.

"And how many fish are you going to vaccinate today?," I asked.

"About 30,000," he replied.

I first thought about all the great photo opportunities. I could get close-up after close-up of our brand new aquaculture specialist grabbing and jabbing fish.

Then I started thinking. Thirty thousand fish! I'll be here forever.

Much to my delight I learned that fish are not vaccinated one by one. They are dipped up by the netfulls and submersed in a medicated solution.

Here are some other things I learned that day about cultivating water:

—Some mountain trout are grown for food, much like poultry. Fingerlings are delivered to the farm like baby chicks, fed special rations until they reach market size, and then hauled to the processing plant like broilers. The only difference is that fish travel in tanks, not cages.

—Some mountain trout are produced to restock waters fished clean of native species. The Cherokees use their fish to restock streams on the reservation. A study shows that the Cherokee reap $67 for each dollar invested in trout through the sale of fishing permits and other goods and services to tourists.

—Trout production is governed mainly by the volume and quality of water that a farmer has. The fish are produced in concrete raceways through which mountain streams are diverted. Fish farmers track the pH of their water like a corn farmer tracks the pH of his soil. And the fish farmer like the corn farmer worries about a drought. The difference is that fish don't wilt until the next rain. They "belly up" if the water is too low to meet their oxygen needs.

In fact, Hinshaw's second stop of the day was at a farm that had lost several thousand fish. Jeff showed the farmer how to measure the oxygen level of his water and advised him to reduce the oxygen demand by getting the bigger fish to market as quickly as possible. ■

Extension Aquaculture Specialist Jeff Hinshaw (right) helps to bring scientific fish farming to Western North Carolina.

Who's Who in Aquaculture

North Carolina State University has assembled the following expertise in aquaculture:

Dr. James E. Easley, professor of economics and business; market feasibility of aquaculture products.

Dr. Jeffrey M. Hinshaw, assistant professor and extension specialist at the Western North Carolina Research and Extension Center, Fletcher; trout aquaculture.

Dr. Ronald G. Hodson, associate professor of zoology and associate director of Sea Grant; pond culture systems.

Dr. Melvin T. Huish, professor, leader of Cooperative Fisheries Unit; aquaculture in farm watershed ponds. Teaches graduate course in aquaculture.

Dr. Howard J. Kerby, former associate professor of zoology; triploidy and seed stock production. Continues as adjunct from the U.S. Fish and Wildlife Service.

Dr. Richard L. Noble, professor of zoology and forestry; fisheries and wildlife program coordinator. Teaches graduate course in aquaculture.

Dr. Edward I. Noga, assistant professor of veterinary science; aquatic animal health, stress in hybrid striped bass.

Dr. James A. Rice, assistant professor and extension fisheries specialist; warmwater specialist; warmwater aquaculture.

Dr. Frank B. Thomas, professor and extension specialist, food science; seafood and aquaculture product technology.

Recruitment is underway to fill two more positions: a finfish aquaculture research scientist and a warmwater aquaculture extension specialist/research scientist. ■

Dr. Easley

Dr. Hinshaw

Dr. Hodson

Dr. Huish

Dr. Kerby

Dr. Noble

Dr. Noga

Dr. Rice

Dr. Thomas

Dr. Herman Berkhoff with hybrid striped bass

Scientist Explains Why Striped Bass Offers Potential

A combination of the right climate, a good market, and hybrid vigor make hybrid striped bass an appealing choice for North Carolina fish farmers.

Until now, most aquaculture has been geared to warmwater production, mostly channel catfish and crawfish, or cold water production, with the rainbow trout. That left areas with temperate waters high and dry. Until the hybrid striped bass came along.

This fish, a cross between a female striped bass and a male white bass, was found to thrive in North Carolina's temperate waters.

Its taste, which is very similar to that of the striped bass, is in demand, especially in the Northeast. With the decline in wild striped bass, a market void was created that the hybrid striped bass could fill, says Dr. Richard Noble, coordinator of the NCSU fisheries program. It has fetched prices of $2 to $3 a pound live weight, much higher than other cultured finfish.

The vigor of the fish is another attraction. It grows quickly, taking about 18 months to reach a marketable size of 1 1/2 to 2 pounds. Its feed conversion efficiency is high; it takes about two pounds of food to produce one pound of flesh.

This bass is adaptable to conventional fish farming techniques in ponds and cages, readily takes pelleted feed and can tolerate high densities.

"Everything about it looks favorable except for limitations on predictable supplies of brood stock," said Noble. Restrictions on collecting wild striped bass and the already limited supply in nature is the major roadblock at this point. Scientists are working on closing the system, which involves producing and keeping brooders in confinement.

Right now no one can predict when hybrid striped bass can be produced on a large scale, due to the limited supply of fingerlings, Noble said. However, "in small-scale pond production, with good management, we can produce and harvest hybrids profitably." ■

Ronald Kuhr To Become Associate Dean, Director

Dr. Ronald J. Kuhr will get a shorter title July 1.

The word "interim" will be dropped from his title on that date and he will become associate dean of the College of Agriculture and Life Sciences and director of the North Carolina Agricultural Research Service.

Kuhr's appointment to the position on a permanent basis will end an odyssey that began Feb. 1, 1986, when Dr. Durward F. Bateman was promoted to dean. A search in 1986 failed to produce a suitable successor to Bateman, and he continued serving as acting director of research while filling his new duties as dean.

Kuhr was asked to assume the associate dean position on an interim basis in January 1987. Later in the year, Dean Bateman appointed a new search committee, chaired by Associate Dean James L. Oblinger. After some initial reluctance, Kuhr agreed to become a candidate for the position on a permanent basis.

"Dr. Kuhr has done an excellent job as interim associate dean," said Bateman. "He is highly respected by his colleagues; he is an outstanding scientist; he knows how to work with people; and he has a wealth of experience that will serve the university and North Carolina agriculture well. We are fortunate to have a person of his caliber in this key position."

As the title implies, Kuhr actually wears two hats in his new position.

As the 18th director of the N. C. Agricultural Research Service, he heads the oldest component of NCSU. Established by the 1877 General Assembly as the N. C. Agricultural Experiment Station, the Research Service was given its present name in 1977. It is now responsible for a $60 million research program that spans 25 departments in four colleges.

As associate dean, he joins the college's top administrative staff. In addition to Kuhr and Bateman, this staff consists of Dr. C.D. Black, associate dean and director of the N. C. Agricultural Extension Service; Dr. James L. Oblinger, associate dean and director of academic affairs; and Dr. Robert E. Cook, assistant dean. These five men have the ultimate responsibility for college policies, program development and evaluation, faculty selection and promotion, and budget planning and management.

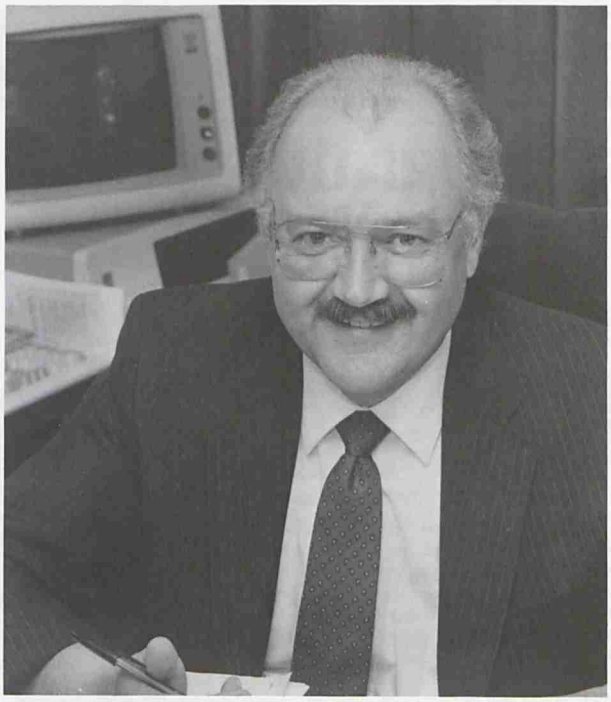
This "team approach" to college management was a factor in persuading Kuhr to apply for the position.

Another factor is what Kuhr describes as "Durward's openness."

"He is open to suggestions; he is willing to listen," Kuhr said of the dean.

As someone who has worked with the total research program for the past 16 months, Kuhr says he continues to be impressed with its diversity, strength and quality.

"Also, I can't stress enough the advantages of having the life sciences and agriculture in the same college," he said. "In many ways they are really one and the same. Agriculture is understanding living systems and that's what biology is all about. We use what we know about living systems as we grow plants and animals and as we are involved with those things that support life." ■



Dr. Ronald J. Kuhr, Associate Dean, College of Agriculture and Life Sciences and the 18th Director of The North Carolina Agricultural Research Service.

Ron Kuhr At A Glance

Personal: Born Dec. 29, 1939, Appleton, Wis.; married; three children.

Education: B. S., education (chemistry), University of Wisconsin; Ph. D., agricultural chemistry, University of California, Berkeley.

Experience: 1966-68, NIH post-doctoral fellow, Pest Infestation Laboratory, Slough, England
1968-78, assistant and associate professor, insect toxicology, Cornell University, New York State Agricultural Experiment Station
1974-75, visiting professor, University of Guelph, Ontario, Canada
1978-80, professor of entomology, Cornell University
1977-80, associate director of research, College of Agriculture and Life Sciences, Cornell, and associate director of the Cornell Agricultural Experiment Station
1980-86, professor and head, Department of Entomology, NCSU
1987-present, interim associate dean and director, North Carolina Agricultural Research Service, NCSU

Major Research Interests: biochemical mechanisms responsible for insect resistance to insecticides, metabolism of carbamate insecticides, and environmental degradation of pesticides.

My Philosphy of Administration

By Ronald J. Kuhr

The quality and productivity of a college's research program reflect the quality, ingenuity and creativity of the faculty. Thus, the most important tasks of research administrators include the selection and promotion of new faculty and continued development of existing faculty. Research administrators must do everything possible to create an atmosphere in which each faculty member can reach his or her potential. This can be done by providing such things as space, equipment, encouragement and recognition.

Research administrators must appreciate the spectrum of research needed in a College of Agriculture and Life Sciences. This ranges from the most fundamental to the very applied, and from individual discipline-oriented projects to multi-discipline and multi-agency programs. A long-term balance between these extremes must be maintained within departments and across the college. It is recognized, of course, that the pendulum does swing from time to time in one direction more than the other. Some department programs will be primarily basic; others will be primarily applied. Some problems will be solved by one discipline; others will require an interdisciplinary approach. In any event, research in a soybean field is no more or less important than research in a petri dish. Quality research is essential in all cases.

With respect to allocation of funds, it is best to put resources as close to the action as possible. This means in the department. The administration should hold back some funds for new research thrusts, major renovations, expensive pieces of equipment and other emergencies, but the bulk of the funds should go where the day-to-day program decisions are made. The director should not be doling out funds on an individual project basis.

Careful planning is another important aspect of successful research. Establishing short and long-term goals, setting priorities, initiating new projects and terminating less important projects are exercises that should occur in individual programs, department programs and college programs. Research administrators must be aware of state and national research needs and initiatives and consider these in setting the overall research agenda for the college.

Finally, research administrators should be receptive to ideas from all quarters. They should be willing to listen more than to talk. They must be able to evaluate research from a broad range of areas and to work effectively with a wide variety of people. Administrators and faculty members should be partners, not adversaries. They should work together to provide the state and science with the best possible programs for the solution of problems and the advancement of knowledge.

Focus on People

Congratulations

Dr. Theil

Baker

Bowers

Dr. Elizabeth C. Theil, professor of biochemistry, who received a 1988 O. Max Gardner Award, the only honor for which all faculty members of the 16-campus University of North Carolina are eligible. Her recognition marks the second consecutive year and the 12th time in history that a faculty member from the College of Agriculture and Life Sciences has received the prestigious honor. Named for a former governor, the award recognizes faculty members who have "made the greatest contribution to the welfare of the human race." Theil was recognized for her studies of iron metabolism and related blood disorders. The citation to her noted that almost one-fourth of the world's population suffers from serious blood disorders involving the ability to store and metabolize iron. She is widely described by peers as the world's foremost expert and researcher concerning the biology of ferritin, an important iron-storage protein. The author or co-author of more than 100 scholarly publications, Theil is director of the University Honors Council. In 1987, the National Institutes of Health awarded her with Merit Status, which allows her to continue her research for several years without preparing competitive grant proposals. She is to become a University Professor on July 1, the first woman at NCSU to hold this title.

Wallace R. Baker Jr., who has been named superintendent of University Farms, the second person to hold this title. He will succeed Henry Marshall, who is retiring after a 30-year career. A native of Perquimans County and a 1960 graduate of NCSU, Baker has 24 years of experience in research farm management. For the past 13 years, he has been superintendent of the Central Crops Research Station, Clayton. "Wallace has been a very good superintendent at Central Crops," said Dr. Ronald J. Kuhr, associate dean and director of research. "We were looking for someone with his background and experience; everyone is enthusiastic about the appointment," Kuhr added. Wallace's brother Don is extension director in Pasquotank County.

Robert J. (Bob) Bowers, who has been selected by the CALS faculty as its 1988 Alumnus of the Year. Bowers is a Lee County farmer, a widely known conservation leader and a 1952 graduate (agricultural education) of NCSU. He produces tobacco, beef cattle, corn, small grain, soybeans and hay crops. Bowers was chairman of the N. C. Soil and Water Conservation Commission for eight years. He has been a soil and water conservation district supervisor for 31 years, chairman of the research committee for the N. C. Association of Soil and Water Conservation Districts for 25 years, and chairman of the Land Use and Natural Resources Committee of the State Grange for eight years. Bowers is a former state chairman of the Agricultural Program Committee of the N. C. Agricultural Extension Service, former chairman of the Dean's Advisory Council for the College of Agriculture and Life Sciences, and in 1981 was state chairman of the Nickels-for-Know-How Referendum.

Luther E. Brown, agricultural research technician in the Department of Crop Science, who has been recognized by NCSU for 40 years of service. Brown says he brings the subject of retirement up every few months, but after a week or so he convinces himself that he should continue working. Close behind Brown are **Allan Robinson**, photographer in the Department of Agricultural Communications; and **Tearee Utley**, farm equipment operator, Central Crops Research Station, both with 35 years of service. Altogether, 33 people from the College of Agriculture and Life Sciences were given tenure awards at the 14th annual staff employee recognition luncheon. Receiving 30-year awards were:

Bobbie E. Baily, data entry supervisor, dairy records processing center; **Joyce A. Burns**, research analyst, crop science; **Issac C. Cotton**, agricultural research assistant, Unit –5; **Walter F. Haskins**, research analyst, weed science; **Virginia N. Langdon**, secretary, extension service; **Iris W. Morris**, photo-typesetter, agricultural communications; **Macy M. Stell**, secretary, extension 4-H office; **Joyce A. Taylor**, extension education specialist, seafood laboratory; and **George Ray Wilder**, laboratory manager, plant pathology. Receiving 25 year awards were **Wallace R. Baker Jr.**., superintendent, Central Crops Research Station; **Harley E. Blackwell**, superintendent, Mountain Horticultural Crops Research Station; **Jo Ann J. Byrd**, clerk, economics and business; **Janet B. Carey**, computer operator, dairy records processing center; **Polly A. Carlsen**, secretary, plant pathology; **Grace B. Cooke**, data entry operator, dairy records processing center; **Ray M. Conn**, lab manager, soil science; **Nola P. Daniel**, data entry operator, dairy records processing center; **Penny H. Dixon**, accounting specialist, agriculture research administration; **Ronnie G. Ellis, Jr.,** payroll and benefits officer; **Keith V. Glover**, secretary, agricultural communications; **Eleanor B. Hart**, secretary, agricultural research service; **Marie L. Holt**, administrative assistant, academic affairs; **Joyce B. Johnson**, secretary, plant pathology; **Dorothy L. Kennihan**, administrative assistant, agricultural extension service; **Edith S. Mizelle**, secretary, animal science; **Donald C. Parry**, research analyst, crop science; **James D. Pettyjohn**, research analyst, animal science; **Rita H. Reynolds**, secretary, entomology; **Marjorie W. Russell**, secretary, agricultural extension service; **Bee M. Smith**, personnel assistant, dean's office; and **Betty B. Williams**, secretary, agricultural communications.

Recognized for service: (left to right) Bailey, Brown, Morris, Robinson, Langdon, Stell, and Wilder.

Recognized for service: (seated left to right) Russell, Byrd, Kennihan, (standing left to right) Daniel, Baker, Smith, Blackwell, Carlsen, Williams, Johnson, Glover, Holt, Dixon, Reynolds, Hart, Ellis, and Haskins.

Dr. Ronald Wimberley, professor of sociology and anthropology, who has been named by the Rural Sociological Society as editor of its Rural Studies Series. **Dr. William Clifford**, another professor in the same department, has been appointed to the editorial board of the series for books dealing with demography and ecology.

Dr. Eugene J. Kamprath, professor of soil science, who has been installed as the 1988-89 president of the Scientific Society of Sigma Xi. Other new officers include **Dr. Robert H. Miller**, head of the Department of Soil Science, secretary; and **Dr. Victor A. Jones**, professor of food science, treasurer.

Dr. Robert P. Patterson, professor of crop science, who has been elected to the NCSU Academy of Outstanding Teachers for the fourth time. Elected to the academy for the second time was **Bryce H. Lane**, lecturer, horticulture. Elected for the first time were **Dr. Kenneth L. Esbenshade**, associate professor of animal science; **John P. Huggard**, lecturer, economics and business; and **Dr. Joseph Kleiss**, associate professor of soil science. **Drs. Charles F. Lytle, Grover C. Miller**, professors of zoology, and **Jon F. Ort**, associate professor of poultry science, who have been elected to the Executive Council of the Academy of Outstanding Teachers.

Dr. Major M. Goodman, professor of crop science, who has been appointed to the Board of Governors of the University of North Carolina Press by the UNC Board of Governors.

Drs. Arthur Coutu, professor of economics and business, and **Chester D. Black**, associate dean and director of the N. C. Agricultural Extension Service, who received Gamma Sigma Delta's 1988 Certificates of Merit. New faculty initiates into the honor society are **Drs. Paul E. Dew**, assistant director of the N. C. Agricultural Extension Service; **Robert L. Moxley**, professor of sociology and anthropology; **E. Barclay Poling**, extension associate professor of horticulture; **Walter N. Thurman**, assistant professor of economics and business, and **Dennis J. Werner**, associate professor of horticulture. New alumni initiates are **William B. Jenkins**, president of the N. C. Farm Bureau; **Joseph L. Landino**, owner of Landino Farms, Columbia; and **William G. Parham Jr.**, deputy N. C. commissioner of agriculture. **H. Frederick Gale**, Department of Economics and Business, and **Louie E. Ross**, Department of Sociology, Anthropology and Social Work, won the society's outstanding teaching assistant awards. Gamma Sigma Delta officers for the coming year are **Drs. Gordon Miner**, professor of soil science, president; **Walter Skroch**, professor of horticulture, president-elect; **Katie Perry**, associate professor of horticulture, secretary-treasurer; and **Wanda Collins**, professor of horticulture, historian.

Kenneth N. Patterson, who was promoted from agricultural agent to Alexander County extension director, effective May 1.

The 28 CALS faculty members whose promotions have been approved for July 1. Approved for the rank of professor are **Roger Crickenberger**, animal science; **R. E. Carawan**, food science; **G. L. Catignani**, food science; **T. C. Lanier**, food science; **T. R. Klaenhammer**, food science; **J. R. Ballington**, horticultural science; **R. E. Johnston**, microbiology; **D. P. Schmitt**, plant pathology; **L. D. King**, soil science; and **M. K. Wohlgenant**, economics and business. Approved for rank of associate professor are **J. D. Richardson**, adult and community college education; **K. R. Pond**, animal science; **A. R. Rubin**, biological and agricultural engineering; **A. H. Bruneau**, crop science; **R. L. Brandenburg**, entomology; **E. A. Foegeding**, food science; **Peggy Foegeding**, food science; **J. E. Rushing**, food science; **S. J. Schwartz**, food science; **Cynthia Johnson**, home economics extension; **Judieth Mock**, home economics extension; **A. R. Bonanno**, horticultural science; **J. B. Carey**, poultry science; **M. J. Wineland**, poultry science; **W. S. Broome**, soil science; **T. W. Rufty**, crop science; and **M. A. Daeschel**, food science. **Sandra Dellinger**, extension home economics, has been approved for the rank of assistant professor.

Dr. Simon K. Garber, who was promoted from specialist to specialist-in-charge of extension sociology, effective March 1.

Drs. Raymond C. Long and **Frederick T. Corbin**, professors of crop science, who have been elected vice chairman and secretary, respectively, of the NCSU Faculty Senate. Long's post will automatically lead to the chairmanship in 1989-90.

Dr. Allen H. Rakes, professor of animal science, who received the Honors Award for 1988 from the Southern Branch of the American Dairy Science Association. He was cited for his leadership of the Southern Branch, his dedication to teaching and advising students, and for his research in support of dairy producers.

F. Daniel (Danny) Shaw, who is slated to move from agricultural agent to Onslow County extension director, effective July 1.

Best Wishes

Carol R. Baker, Union County extension agricultural agent, who retired April 30 after 33 years of service.

Mary G. Cowper, Gates County home economics extension agent, who retired March 31 after 25 years of service.

Leroy James, Pitt County extension director, who retired April 30 after 30 years of service.

Dr. Fred N. Knott, specialist-in-charge of extension dairy husbandry and professor of animal science, who plans to retire Aug. 31 after 32 years of service.

Dr. Nathaniel T. Powell, extension specialist and professor of plant pathology, who plans to retire June 30 after 31 years of service.

Carolyn C. Register, extension specialist, educational programs, who plans to retire May 31 after 32 years of service.

Robert M. Shaw, Columbus County agricultural extension agent, who plans to retire May 31 after 20 years of service.

Dr. Samuel B. Tove, William Neal Reynolds Professor of Biochemistry, who plans to retire June 30 after a 38-year career, 13 of them as head of the Department of Biochemistry.

Wesley Townsend, Wayne County extension director, who plans to retire June 30 after 20 years of service.

Billy G. Westbrook, Alexander County extension director, who retired April 30 after 30 years of service.

Deaths

Evans

Dr. James B. Evans, the first head of the Department of Microbiology, died Feb. 19 at the age of 67. A native of Gainesville, N. Y., and a graduate of Cornell University, Evans joined the NCSU faculty in 1960 as a professor of bacteriology in the (old) Department of Botany and Bacteriology. He was hired specifically to develop a research staff and curriculum in microbiology. Evans' work resulted in the formation in 1963 of an interdepartmental microbiology faculty under his chairmanship and the creation in 1965 of a Department of Microbiology, also under his leadership. He remained head of the department until his retirement on Dec. 31, 1984. Survivors include Mrs.(Evelyn) Evans, who resides at 5020 Devonwood Court, Raleigh. Also surviving are two sons and one daughter.

Ferguson

J. C. Ferguson, an extension agricultural engineering specialist from 1936 to 1966, died Feb. 29 in Raleigh at the age of 83. Much of his career was spent working with cotton growers and ginners and 4-H members. After his retirement, he served as the first executive secretary of the N.C. Chapter of Land Improvement Contractors of America. A second area of interest was the preservation of old farm equipment, which he proudly helped to display at the N.C. State Fair. (See feature on this subject in the April 1985 issue of SALS Today.) Another source of pride were the hands and numerals on NCSU's bell tower; he helped to make them.

Workshops Give Science Teachers Bridge To Campus

By David Caldwell

Groups of high school science teachers have dispersed to offices throughout Ricks Hall, where they huddle in animated conversation — talking bugs.

The talk turns on topics ranging from the best way to raise fruit flies to activities that will bring high school students and mosquitoes into academic proximity.

Martha Ramsey discusses a point during a Saturday morning session of the Science Teachers Advisory Board. Ramsey, an NCSU graduate student and chairman of the science department at Garner Senior High School, serves as research assistant to the board, helping to organize board meetings and compile lesson plans.

The teachers are participants in a pilot program sponsored by the College of Agriculture and Life Sciences that is designed to act as a bridge between campus academic and research programs and science classrooms in high schools throughout North Carolina.

"There is a lot of interesting research going on on campus that is not yet in textbooks," explains Lynn Padgett, a publications editor in the Department of Agricultural Communications and one of the organizers of the program. "We thought it would be useful for (high school science) teachers to have access to this information."

Padgett edits Research Perspectives, a quarterly magazine published by the North Carolina Agricultural Research Service that features CALS research. The magazine is an integral part of the program.

Padgett and Dr. Jack H. Wheatley, associate professor of mathematics and science education in the College of Education and Psychology, last year selected 18 high school science teachers to serve on a Science Teachers' Advisory Board. Wheatley is the board's curriculum adviser.

High Schools from across the state — "from Weaverville to Wilmington," as Padgett puts it — are represented on the board. Weekend board meetings were held in October, December, February and April.

Meetings begin with Friday evening dinners at which an NCSU scientist gives a presentation related to his or her research. Among the scientists who have addressed the group are Dr. Robert Bruck, Dr. Clement Markert and Dr. Sylvia Blankenship.

Bruck discussed his work on Mt. Mitchell, where scientists are trying to determine why trees are dying, while Markert described genetic research designed to produce better pigs. Blankenship talked about research aimed at understanding the ripening process in plants.

The teachers gather at Ricks on Saturday, where they spend the morning devising lesson plans, or student activities, related to the subject discussed the night before. Blankenship's presentation, for example, elicited a plan describing an experiment that demonstrates how ethylene gas affects the ripening of an avocado.

Insects were the topic of the day on one recent Saturday. The teachers brainstormed ways students might learn more about mosquitoes and other insects.

Research Perspectives supplements the lesson plans. In the magazine are articles on the research being done by the Friday evening speaker and other NCSU research in the same general area. The issue of the magazine designed to coincide with Blankenship's presentation included articles on grape, peanut and forage research.

A package containing the magazine and lesson plans is sent to each of the state's 2,194 high school science teachers. Already, students have used the lesson plans to develop contest-winning science projects, according to several board members.

Teachers, however, may be benefiting from the program as much as students.

Indeed, Dr. James L. Oblinger, CALS associate dean for academic affairs and administrative liaison for the program, says he has received several unsolicited letters from science teachers thanking the university for the lesson plans.

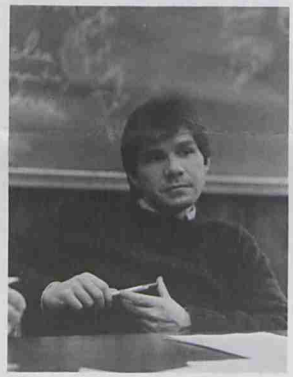
High school science teachers, Oblinger points out, are a vital link between the university and promising students. Science teachers are by far the largest single influence on students to attend NCSU, according to a survey of first year CALS students.

Yet many high school science teachers do not realize that the agricultural college at NCSU is also a college of life sciences. The program should help reach these teachers, who Oblinger calls "an overlooked and important audience." ■

Sandra Anglemyer, board member and biology teacher at Northern Nash Senior High School, believes teachers throughout North Carolina are benefiting from the material the Science Teachers Advisory Board helps prepare. The program, she says, extends to teachers a feeling that NCSU is interested in them and their problems. "It's just a shot in the arm. Everybody leaves the (weekend sessions) enthused and ready to go," she adds.

Teachers Comment on Workshops

Roy Kimmins, biology teacher at Graham High School, sees the Science Teachers Advisory Board as a bridge between high school science classrooms and CALS academic and research programs. "As science teachers, we're expected to prepare students for universities, but we have little contact with universities," he says. Kimmins adds that many students tend to think that cutting edge scientific research is done only in exotic, faraway locales."



Marshall Recalls Progress On Research Farms

Henry Marshall is driving the roads, surveying the land he may know better than anyone.

He seems most in his element here, on the ground, assessing the crops growing in the surrounding fields on a warm spring day. He points out the corn just emerging from the soil. It has a yellow cast to it, a result, he says, of cold weather the last few days.

When a passenger asks what kind of flowers those are growing beside the road, Marshall impulsively pulls his pick-up to the road side, jumps out and begins examining bachelor's buttons.

He gathers a bouquet of the wild flowers, stops to contemplate the fields that line the road.

Like many an executive overseeing a growing empire, Marshall has found the demands of the job limit the time he is able to spend in the field.

"When I took this job, I could spend 40 percent of my time in the office, the rest on the farm," Marshall says almost wistfully. "Now it's 80 percent in the office."

The job, superintendent in charge of North Carolina State University's agricultural research units, has been Marshall's since 1964. He worked for NCSU as a research associate from 1958, the year he graduated from NCSU, until he was named superintendent.

Marshall's over 30-year association with the university will end June 30, when he retires.

He is the only research units superintendent the university has ever had. There were research units before Marshall came to NCSU, but their administration fell to individual departments. The units were combined into a single administrative entity in 1964, and Marshall was named its supervisor.

Marshall today manages what amounts to a 3,600-acre farm — most of the units are scattered about Raleigh, although a new beef cattle unit opened recently near Butner.

While there is satisfaction to be derived from the management of day-to-day farm operations, Marshall says the part of the job he enjoys most is what he calls "developing a research farm." Good thing. The university has seen the need over the years for a considerable amount of development.

There are 260 buildings scattered about the units today, Marshall says. There were 84 when the Forsyth County native took the job.

Making a research farm, Marshall says, is a relatively simple proposi-

(*See* **Marshall. . .** *page 8*)

Home of First CALS Dean Retains Original Elegance

By David Caldwell

The house on the corner recalls a time long past.

A spacious front porch, once a refuge on a summer evening from the heat and cares of the day, wraps gracefully around the structure.

In the yard, shade trees that once served as playgrounds for the neighborhood's children stand now as friendly sentinels. Inside, the height of the ceilings reveals the structure's age and forestalls efficient heating and cooling.

The youth of the house at 1405 Hillsborough Street is long past, yet the memories of that earlier time linger still.

Frances Park lives today in the elegant Hillsborough Street home her father built in 1909. Mrs. Park's father was C. B. Williams, the first dean of agriculture at what would eventually become North Carolina State University.

Williams was associated with NCSU from the university's origin. He was a member of the first graduating class of what was then The North Carolina College of Agricultural and Mechanic Arts. In all, he served what was to become North Carolina State University in various capacities for 53 years. He died at his home in the summer of 1947.

Mrs. Park was 7 years old when her family moved to the house on the corner of Hillsborough Street and Park Avenue. Her father built the house for $5,000, she says. The lot cost another $2,500.

The house was just outside the city limits then, Raleigh being contained within one square mile. The families of other faculty members populated the neighborhood in which Mrs. Park, her brother Frank and sister Susanne, both deceased, grew up.

The surnames of many of Mrs. Park's childhood playmates today are affixed to campus buildings. Randy Hill, daughter of D. H. Hill, and Anna Riddick, daughter of Wallace Riddick, were members of the neighborhood gang. Williams Hall is, of course, named for Mrs. Park's father.

Thomas N. Park, son of Charles B. Park, for whom Park Shops is named, also was a childhood playmate. In this case, the playmates eventually became sweethearts, and Frances Williams married Thomas Park.

"He was a very modest man... I didn't realize until he died what he had accomplished."

Hillsborough Street was a good place, during those early years of the university, to be a child.

The circus came to town each year and camped directly across the street, Mrs. Park recalls. At first it was P. T. Barnum's circus. Later, Bailey joined up.

The state fairgrounds was directly across Hillsborough Street from the campus.

"Papa was one of the first directors (of the state fair), and we got in free," Mrs. Park says. "They always had a parade for the opening of the fair. We had a wonderful time at the fair."

Williams walked the half mile or so to his office in Patterson Hall, his daughter says. He came home for lunch, at which time he smoked the one cigar he allowed himself each day. Mrs. Park recalls the campus as consisting of little more than Patterson and Holladay Halls and a few small dormitories.

Williams home at 1405 Hillsborough Street is about 10 blocks from Patterson Hall.

Williams traveled widely. Not only did he crisscross North Carolina, but he toured parts of the Orient, Europe and the American West studying the crops grown and agricultural methods employed. Yet he never learned to drive.

Mrs. Park says he tried unsuccessfully to learn to drive her grandmother's Rickenbacker.

Williams grew up on the water in Camden County and was familiar with boats. The steering mechanism on a boat differs from that on a car in that a boat turns opposite the direction the steering wheel is turned. He tried to drive the Rickenbacker as he would a boat. He went left when he intended to turn right.

"He didn't do that but once or twice," Mrs. Park says, "before he gave up driving."

Mrs. Park and her own family eventually occupied the second floor of the Hillsborough Street house, while her father and mother remained on the first floor.

Thomas and Frances Park raised four children in the house. Frances Carroll, one of three daughters, lives with her mother today. Another daughter, Margie Lucas, is a Cary resident. The third daughter, Susanne Whitley, lives in Newport, R.I.

The only boy, Tom Park, maintains a home in Goldsboro but operates a plant maintenance business in Raleigh. He stays at his mother's home for a part of each week while tending to his business.

Neither Mrs. Park nor her children recall Williams talking much about his work.

"He was a very modest man," says Frances Carroll of her grandfather. "I didn't realize until he died what he had accomplished."

The grandchildren knew Williams simply as "B." Susanne Whitley, the eldest of the grandchildren, pinned this sort of nickname on her grandfather.

Margie Lucas recalls her grandfather as a "great admirer of George Washington Carver. I remember him talking about him."

Frances Park still lives in house her father built in 1909.

Williams was among the first in the nation to see the potential of the soybean and was a tireless promoter of what has since become a major crop. His promotional efforts extended to extolling the virtues of creations such as crackers and cookies made from soybean flour.

Nutritious as these creations might have been, they were less than tasty. Mrs. Park says the Williams children often were called on to test new soybean treats.

"We suffered through a lot of his experiments," she says.

As might be expected, the agronomist liked to putter in the yard. Mrs. Park recalls her father tending a rose garden at the rear of the house and lining the yard with pansies.

The pansies and roses are long gone, but the yard still bears Williams' imprint. He returned from a trip to the Orient with two trees he identified as Chinese pistachios. He planted the trees in the front yard, near the street.

The trees have prospered. They stand today, like the house they guard, as reminders of a time long past. ■

CALS TODAY

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CALS Identifies Four Funding Priorities

The College of Agriculture and Life Sciences will follow a new tact in presenting its change budget requests to the 1989 General Assembly.

Instead of seeking funds primarily on a commodity-by-commodity basis, as it has done in the past, the next requests will be centered around four critical issues:

—sustaining the competitiveness of North Carolina agriculture;

—enhancing North Carolina's natural resource base;

—improving the nutrition, diet and health of North Carolina citizens; and

—revitalizing rural North Carolina.

Twelve million dollars to expand programs in these four areas is being sought for each year of the 1989-91 biennium. These requests have been developed, reviewed and trimmed in the college. They have been endorsed by agricultural leaders in the state and will be further reviewed within the university system before being presented to the Advisory Budget Commission in the fall.

Asst. Dean Robert E. Cook noted that CALS' last (1987) change budget requests consisted of 10 "packages" dealing mostly with commodities. "We believe the critical issues approach will result in less splintering of our efforts and enable us to communicate our needs to a broader spectrum of people."

Also, the critical issues approach has been used successfully in the last year by the Agricultural Extension Service at the national level to improve its funding position with Congress.

Here is a list of the change budget funds being requested for each year of the biennium and an explanation of how they would be used:

Agricultural Competitiveness — $5,889,950. Goals are to improve the economic efficiency and integration of the total agricultural system from producer to consumer; acquire timely, accurate information to adjust profitability to global changes in supply and demand; integrate marketing strategies into the production management system; and develop and transfer new technology to producers and businesses.

Natural Resource Base — $1,877,700. Goals are to sustain a productive natural resource base, particularly forest lands; assist in the development of markets for natural resource products and services; determine the impacts of agricultural, industrial and household chemicals on water quality and subsequent uses and users of water; and develop alternative strategies for maintaining or improving the natural resource base, especially water.

Nutrition, diet and health — $1,018,500. Goals are to improve the health and well being of citizens through the adoption of recommended dietary practices and life styles; improve the ability of consumers to make informed choices related to food safety, quality and composition; and improve the understanding of the food system among consumers, policymakers, the media, and food producers, processors and handlers.

Rural Revitalization — $3,213,850. Goals are to maintain and enhance the profitability of rural businesses; find alternative uses for rural resources through economic development; develop educational programs to help rural communities, families and individuals cope with transition; help families improve their financial stability by gaining control of their finances and other resources; and develop educational programs to foster an understanding of the impact of natural resources on the quality of urban and rural life.

Cook said new funds received will be divided on a 60-40 basis between the Agricultural Research Service and the Agricultural Extension Service.

In addition to the change budget requests, CALS is seeking from the 1989 General Assembly about $12.9 million for capital improvements. This money would be used to expand and renovate Scott Hall, renovate and build new facilities for laboratory animals, construct a building for the Department of Agricultural Communications and build aquaculture research facilities.

Pickings were slim the last time CALS asked the General Assembly for new monies. Legislators approved only $700,000 (to plan the Scott Hall project) of the $7.5 million requested in capital improvements. They provided $1.5 million of the $3.9 million requested in the change budget, but nearly half ($715,000) of this was earmarked.

Because the college was given so few new funds in 1987, the General Assembly will be asked to reconsider some of the earlier requests when it convenes for a "short session" in June. ■

Marshall Ending 30-year Career

(*continued from page 6*)

tion. "All it takes is a bulldozer and a budget," he claims.

But without a budget, even a builder of Marshall's energy can be stymied. That is what happened in a corner of Marshall's world.

Among the research units Marshall supervises is the area around a 22-acre pond south of Raleigh just off Lake Wheeler Road. The pond is the site of Yates Mill, a now dilapidated grist mill that is thought to have been built in the 1750s.

The old mill has been the focus over the years of unsuccessful restoration efforts. Often as not, Marshall was involved in those efforts.

Money has been the stumbling block. Neither the university nor any other group has been able to foot what would likely be a substantial restoration bill.

In the meantime, the old mill, which is listed on the National Register of Historic Places, deteriorates.

Marshall is intimately familiar with the old building. Walking through the structure, he points out the millstones and other machinery, most still in relatively good condition.

The building appears to be structurally solid, but the mill wheel long ago fell into the adjacent Steep Hill Creek, the walls are crumbling in many places, and the stone spillway is choked with weeds.

Marshall has done what he could. On several occasions he hammered parts of the building's roof back on in an effort to prevent further damage.

"I just don't like to see anything fall down and the next generation not know what an old mill looks like," he says.

That is an understandable sentiment from a man who has spent much of his life putting things up. ■

Henry Marshall has seen almost 200 new buildings erected on university research farms, but money to restore historic Yates Mill (background) never came.

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January 9, 1989

MEMORANDUM

TO: Dr. Bruce R. Poulton, Chancellor
Dr. Nash Winstead, Provost
Dr. Murray Downs, Associate Provost
Dr. George Dixon, Admissions
Advisors

FROM: W. C. Grant, Chairman W. C. Grant
Preprofessional Health Sciences Review Committee

SUBJECT: Medical School Admissions, Fall 1988

Enclosed is information from the Preprofessional Health Sciences Review Committee concerning medical school admissions for 1988.

nc

NORTH CAROLINA STATE UNIVERSITY AT RALEIGH

Premedical Review Committee Information on
Medical School Admission

Entering Class: 1988-89

Total Applicants: 74

Number of Students Accepted: 45

Number of Students Matriculated: 40

Mean GPA for Biol., Chem., Physics Math	Mean Undergrad. GPA	MCAT Scores. (mean) for 43 students*					
		Biol.	Chem.	Physics	Sci. Prob.	Read-ing	Quant.
3.51	3.48	10	09	10	09	09	09

Medical Schools	No. of NCSU Students Attending
UNC	21
ECU	7
Bowman Gray	6
Duke	4
Uniformed Services Univ.	1
Kentucky - Louisville	1
Eastern Virginia	1
Oregon	1
Tulane	1
Michigan State	1
Virginia	1
	45

Applicants' Areas of Study at NCSU (by College)	Number of Students
Agriculture and Life Sciences	25
Design	0
Education	0
Engineering	6
Forest Resources	0
Humanities & Social Sciences	0
Physical & Mathematical Sciences	5
Textiles	0
Other (postbaccalaureate special students)	9
	45

Additional Information

Mean age: 22 Number of males: 28 Number of females: 17

Self-description codes (males & females combined)

White/Caucasian 43
Asian or Pacific Islander 2

*MCAT Results (Maximum Score - 15 per category)

PROVOST AND VICE CHANCELLOR'S OFFICE

Date: 2/19/86

TO: ~~Dr. N. N. Winstead~~
(2) Dr. Murray S. Downs
(1) ~~Dr. Lawrence M. Clark~~ me
~~Mr. William H. Simpson~~

OTHERS: Angelo
Put on shelf, with Book I in my office

Return to:

Keep for your information:

For Files:

NOTES:

(X W)

Or return to me
Ivoid

AG + Life Sciences

DRAFT

College of Agriculture and Life Sciences

LONG RANGE PLAN

North Carolina State University

July 1988

LONG RANGE PLAN

College of Agriculture and Life Sciences

SITUATION

1. Mission of the College of Agriculture and Life Sciences

The mission of the College of Agriculture and Life Sciences (CALS) is to seek knowledge and educate students and constituents. This mission is central for all organizational units of North Carolina State University (NCSU). Such a mission requires an atmosphere that encourages the pursuit of truth, respect for science, recognition for scholarly work and creativity, and responsiveness to changes and challenges in agriculture, science and society. Also needed are purposeful goals, material support, and an intellectually stimulating environment for faculty and students. The pursuit of the College's mission is especially challenging at this time because of NCSU's aspirations for excellence. The College of Agriculture and Life Sciences has been a major force in the economic development of North Carolina for over 100 years and has helped NCSU attain regional and national renown. Its faculty and staff look forward to additional achievements that will enhance its reputation locally as well as internationally.

In addition to its mission, the CALS has a special responsibility that is derived from NCSU's land-grant origin. The uniqueness of NCSU in the state's system of higher education is expressed as follows in "The Revised Mission Statement for North Carolina State University," North Carolina State University Self Study, Volume 5, Summary of Results and Recommendations, 1984.

> The land-grant philosophy is to maintain a "people's university" that is service oriented and maintains a direct relevance to the development of the people of

> the state, their economy, their enrichment, and the competence of their educational, social and governmental institutions. (p. 19)

North Carolina State University's statutory authority as a land-grant university is derived from three federal laws, all of which have direct application to the CALS. The first of these laws is the Morrill Act of 1862, often called the Original Land-Grant College Act. It authorized grants of land to states that developed colleges for teaching branches of learning related to agriculture and the mechanic arts. The second of these laws is the Hatch Act, enacted in 1887. It gives State Agricultural Experiment Stations broad latitude in using federal funds for research that will contribute to an effective agricultural industry, improve rural life, and help agriculture make a maximum contribution to the welfare of consumers. The third law is the Smith-Lever Act of 1914, which established the Cooperative Extension Service to "aid in diffusing among the people...useful and practical information on subjects relating to agriculture and home economics, and to encourage the application of the same."

Based on NCSU's role in the University of North Carolina system, and the statutory authority that it has been given, the mission of the CALS is summarized as follows:

* Seek new knowledge through research and critical inquiry;
* Teach the principles and application of the sciences, and to instill in students a desire to learn;
* Extend knowledge to citizens so they might use it for the solution of problems in their homes, businesses and communities;
* Cooperate with other agencies and groups to enhance the protection and development of the human, agricultural, and natural resource

potential of North Carolina; and

* Assist in regional, national, and international efforts to meet human needs and advance agriculture and life sciences.

2. Organization of the College of Agriculture and Life Sciences

The College of Agriculture and Life Sciences is the most complex of the eight colleges and two schools that comprise NCSU. It has a division of academic affairs that is similar to all colleges and schools. Its uniqueness and complexity stems from the fact that it contains two statutory state agencies: The North Carolina Agricultural Research Service (NCARS) and the North Carolina Agricultural Extension Service (NCAES). As the attached organization chart indicates, these agencies operate along with academic affairs as divisions of the CALS.

Each of the three divisions -- research, teaching and extension -- is headed by an associate dean and director who reports to the dean. The dean is responsible for personnel and overall leadership for the College; the associate deans and directors are responsible for budgets and the effectiveness of programs in their respective areas.

In addition to the dean and three associate deans and directors, 10 other persons are full-time members of the CAL's administrative team. They are an assistant dean, an associate director for each of the three divisions, an assistant director for research, and five assistant directors for extension.

CALS's programs are conducted through 21 departments, 18 of which offer degrees and 6 of which are jointly administered by other colleges. The three associate deans and directors make separate budget allocations to the

appropriate departments. Department heads insure that the money is used for a coordinated research, teaching, and extension effort. In addition to programs conducted by individual departments, the College has interdisciplinary programs in nutrition, physiology and toxicology and participates in University-wide programs in biotechnology, ecology, and water resources.

The CALS has a special relationship with many organizations, both on and off campus. These include:

Other NCSU Units:

Two departments are jointly administered with the College of Physical and Mathematical Sciences, two with the College of Humanities and Social Sciences, and one each with the College of Education and Psychology and the College of Engineering.

Joint research programs are conducted with the College of Veterinary Medicine, and joint research and extension programs are conducted with the College of Forest Resources. A representative of each of these colleges serves as an assistant director (part-time) of the North Carolina Agricultural Research Service.

An assistant development officer from the Office of University Development is located in the CALS to give leadership to the North Carolina Agricultural Foundation, the North Carolina Dairy Foundation, the North Carolina Tobacco Foundation, and the North Carolina 4-H Development Fund.

The University International Programs Office is headed by a person who also serves as coordinator of international programs for the College and associate director (part-time) of the North Carolina Agricultural Research

Service.

The College operates six 4-H youth camps through its 4-H and Youth Development Department.

Other Universities:

A close working relationship exists with the state's other land-grant institution, North Carolina A&T State University. The administrator of the agricultural extension program on that campus is a member of the Administrative Council for the agricultural extension program conducted by NCSU and NC A & T State University. By law, a comprehensive plan for research and extension for North Carolina is submitted jointly to the United States Department of Agriculture (USDA) by the North Carolina Agricultural Research and Extension Service and NC A & T State University.

The North Carolina Agricultural Research Service supports home economics research in the School of Human Environmental Sciences at the University of North Carolina at Greensboro.

Cooperating Federal Agencies:

North Carolina State University has formal agreements with the USDA stating its willingness to conduct agricultural research and extension programs in exchange for federal funds. These funds consist of two types: (1) formula funds authorized for research and for extension and (2) earmarked extension funds and earmarked funds available through competitive and special grants for research and extension programs. The CALS works closely with USDA's Extension Service, Cooperative State Research Service, Forest Service (USDA-FS), Economic Research Service, and Agricultural Research Service as a result of these funding mechanisms and thus contributes to regional and national research and extension objectives. This latter agency — USDA's

Agricultural Research Service — stations thirty-five scientists in various departments at NCSU where they hold courtesy faculty appointments.

Formal agreements also are maintained with the United States Department of Interior (USDI). These agreements relate to cooperative programs with USDI's Fish and Wildlife Service and United States Geological Survey which has an interest in water resources.

North Carolina Department of Agriculture:

Cooperation with the NC Department of Agriculture (NCDA) is manifested on many fronts. An example of this cooperation is the operation of the 15 outlying research stations. Nine of the outlying stations are owned by NCDA; six are owned by NCARS. NCARS is responsible for the research on all stations; NCDA is responsible for the day-to-day operations. Also, some NCDA employees hold adjunct faculty appointments in CALS.

County Governments:

The North Carolina Agricultural Extension Service has a memorandum of understanding with each of the 100 boards of county commissioners in the state. These memoranda spell out mutual responsibilities for extension work in each county. The NCAES also has an agreement with the Bureau of Indian Affairs to provide extension programs for the Cherokee Indian Reservation.

Cooperators on Teaching Programs:

Opportunities for practical experience are enhanced through internships and cooperative agreements with industries, agencies and municipalities. Under the Federal Cooperative Education Program and other similar programs, undergraduate and graduate students obtain academic credit while employed in laboratories where they are given progressively increasing responsibilities.

Formal agreements have been developed with hospitals to ensure internships for medical technology students to serve their clinical year.

3. Faculty

The faculty of CALS is comprised of 1,118 persons at all levels. Of this number there are 312 at the Professor, 139 Associate Professor, and 89 Assistant Professor rank for a total of 540. There are six (6) Instructors, 50 extension specialists, 82 research assistants/associates, and 234 other non-tenure track positions which include adjunct and visiting faculty, USDA, USDI, and USDA-FS personnel. There are also 206 emeriti faculty.

The responsibilities of these faculty are divided among research, teaching, and extension. Many faculty carry joint appointments such that their responsibilities are divided between research-teaching or extension-research, for example. These appointments total 260 full-time equivalents (FTE) for research, 200 FTE for extension, and 162 FTE for teaching.

The faculty generate a significant portion of the CALS budget through grants, contracts, and memoranda of agreements (Table 3). The leveling of grant and contract monies for research reflects in the same cases a lack of facilities and equipment needed to compete for funds in certain high technology areas. The increase in grants and contracts for extension reflects the increased availability of these funds and CALS competitive position.

4. Financial Resources

The CALS enjoyed a gain in financial resources between 1979 and 1988. Expenditures rose 78 percent (Table 1). However, when expenditures are adjusted for the 49.5 percent rise in the Consumer Price Index during this

period, the gain in constant dollars amounted to 19 percent or about 2 percent annually.

The rate of gain varied for the three college functions -- teaching, research and extension. Expenditures for the teaching program rose the most rapidly, 46 percent in constant dollars (Table 2). As a result, the teaching program accounted for 12 percent of total college expenditures in 1988 as compared to 10 percent in 1979. NCAES expenditures rose the most slowly, 13 percent in constant dollars (Table 3). As a consequence, NCAES's proportion of college expenditures dropped by 2 percent, falling from 40 percent in 1979 to 38 percent in 1988. NCARS's rate of gain matched that of the CALS, 19 percent in constant dollars (Table 4). As a result, NCARS accounted for 50 percent of total college expenditures in 1979 and 1988.

Funding sources shifted rapidly during the 1979-88 period. The largest gains were made in the acquisition of state funds. NCAES received 62 percent of its funds from state appropriations in 1988 as compared to 51 percent in 1979. The proportion of the NCARS budget financed by the state rose from 53 to 60 percent during the same period. As noted earlier, the teaching program, which is supported almost entirely by state funds, enjoyed the largest gain of the three functions due in a large part to the substantial increase in funds for Organized Research. The federal government's historic role in support declined in relative importance. NCAES's federal support dropped from 45 percent of total expenditures in 1979 to 29 percent in 1988. NCARS's federal support dropped from 16 percent to 11 percent during the same period.

The NCAES made significant gains in funds secured through grants, contracts, foundations, and miscellaneous receipts. These funds, which had

accounted for only 4 percent of expenditures in 1979, had risen to 9 percent in 1988. The NCARS support from grants and contracts did not keep pace with support from other sources. As a result, grants and contracts accounted for 22 percent of total research funding in 1988 as compared to 24 percent in 1979.

5. Enrollment

As of the fall 1987 semester, the CALS had 3,401 students (Table 5). These consisted of 2,431 undergraduates, 346 masters candidates, 382 doctoral candidates, 234 Agricultural Institute students, and 8 students who were undeclared.

Total enrollment remained fairly stable since 1979. Overall enrollment statistics mask rapid shifts that have occurred by departments and curricula (Table 6 and Table 7). Social and life science departments have generally gained students. Departments closely associated with production agriculture have generally lost students. The two-year Agricultural Institute has been closely associated with production agriculture and, as a consequence, has experienced a decline in enrollment similar to that of the production departments. The only Institute majors gaining students were those in agribusiness management, ornamental horticulture and turfgrass management (Table 8).

The ratio of undergraduate-to-graduate students changed little between 1979 and 1987 (Table 5). Gains in freshmen and sophomores were largely offset by losses in juniors and seniors. The drop in upperclassmen can be explained in part by "phantom majors," students who enroll in the CALS while awaiting transfer to other colleges.

The CALS experienced an increase in Ph.D. candidates and a decrease in masters candidates. This reflects a nationwide trend among students enrolled in the sciences. Once enrolled in graduate school, an increasing number of students prefer to "go straight through," largely because of the salary differential they can expect.

The CALS experienced an increase in the number of students enrolled in non-departmental programs, defined in Table 6 as biological sciences, dean's office and interdepartmental. The "dean's office" category consists mainly of first-year pre-veterinary students who have not selected an undergraduate major. "Interdepartmental" includes students enrolled in agronomy, integrated pest management and individualized study, such as that offered by the Jefferson Scholar Program. The number of interdisciplinary programs has increased to six: nutrition, ecology, biotechnology, plant physiology, animal physiology, and toxicology.

While overall statistics indicate a decade of relative stability for CALS, rapid enrollment fluctuations occurred in individual departments (Table 9 and Table 1Ø).

CALS has been more successful in recruiting students than in retaining them (Table 11). The number of new students in the fall of 1987 was 9 percent greater than the number of new students in the fall of 1979. However, the number of continuing students dropped 1 percent during the same period. Part of this shift can be explained by the phantom majors referred to earlier.

Enrollment is becoming more evenly balanced between males and females (Table 12). Female enrollment climbed from 39 to 45 percent of the total from 1979 to 1987.

The College has been much more successful in attracting Afro-American

females than Afro-American males (Table 13). The gains for females amount to 158 percent or three times that of males. The Department of Zoology accounted for 47 percent of the Afro-American enrollment in the fall of 1987, and four areas -- zoology, biological sciences, biochemistry and the dean's office-- accounted for 75 percent of the Afro-American enrollment (Table 14).

The proportion of full-time to part-time students remained virtually the same: 78 percent to 22 percent in 1979 and 77 percent to 23 percent in 1987.

The proportion of students from within the state dropped slightly, from 83 percent in 1979 to 80 percent in 1987. Out-of-state students increased from 12 percent of the total in 1979 to 15 percent in 1987. International students remained at 5 percent during the period.

The quality of students entering the College, as measured by SAT scores and high grade point averages, varied relatively little from 1979 to 1987 (Table 15 and Table 16). CALS students fell slightly below the university average on both measurements for most of this period. New freshmen entering CALS from 1979 to 1987 averaged 991 on their SAT scores. No consistent data are available over time that reflect the quality of graduate students.

CLIENTELE GROUPS

1. Students

The resident student body is the most visible clientele group served by CALS, having highly structured and continuing contacts with the faculty in every department. Diverse student interests, including major changes in the life-long goals of many incoming freshmen, are reflected in specialized two-year, four-year and graduate programs. Graduate programs develop professionals who share in the development of new knowledge and become future leaders in business, research, extension, and teaching communities. Needs of non-traditional students are met through evening and off-campus offerings and specialized short-courses. Successful educational programs call for recruitment of highly qualified candidates, effective advising and teaching, and placement assistance. Alumni provide support for college programs and a potential network for recruitment activities.

2. Scientific Community

Scientific inquiry provides the foundation for all activities in which CALS faculty are engaged. Relationships with the scientific community provide a means of information exchange with colleagues on and off the campus through published work, presentations at professional meetings, and participation in regional and national association affairs. Recognized preeminence in the national scientific community is essential to development of the strongest institution possible for service to the state of North Carolina.

3. Producers and Marketing Firms

Producers have been a key constituency of CALS since its founding, influencing the direction of research, extension, and teaching activities in the CALS. Businesses play a key role in the development of a competitive production and marketing system, providing the inputs used in farming and in the assembly, processing, and distribution of agricultural and natural resource products. Producers and businesses are the primary users of information developed in the CALS. Credit agencies have an interest in how new technologies affect the capital requirements of their farm and agricultural business clients.

Extension programs are designed to provide rapid transfer of knowledge that will be useful in the management decisions of both commercial and part-time farm operators, for businesses, and for credit agencies. Commodity groups serve as an important link between NCSU and farm and agribusiness firms, assisting in the transfer of information and in the design of policies and programs that affect the welfare of their members.

4. Citizens and Communities

The land grant college system was developed to serve family and community needs as well as those of agriculture and industry. Information reaching individuals and families provides assistance in homemaking decisions related to food and nutrition, housing, family stability, financial security, and special problems facing youth and the aged. Youth constituencies receive training which improves competency and coping skills, enabling them to make greater contributions to the community.

Local communities rely on the CALS for assistance in community

leadership and organization, land use management health care, waste management, water management and other public service systems, and employment opportunities. An increasing component of the CAL's efforts focuses on the concerns of urban communities.

5. Governments

The expertise of the CALS faculty is often called upon by governmental bodies for assistance in the formulation and evaluation of laws and regulations relating to the use of natural resources and in the maintenance of land, air, food, and water quality. These bodies include county, state, and national constituencies as well as special study commissions.

Public service agencies also constitute important CALS clients. Agency concerns include improvement of information services, credit, economic development planning, and natural resource management.

6. National and International Community

As North Carolina and the nation enter a new era of national and international trade dependency, the faculty of CALS is asked to play a much larger role in activities that cross state and national boundaries. Trade associations seek information on market development prospects. Out-of-state and international undergraduate and graduate students bring new insights to their fellow students and new dimensions to academic discussions. National and international research and extension organizations call on the CALS faculty who have experience in developing productive research institutions and effective information delivery networks. International development organizations offer an opportunity for increasing the understanding of CALS

faculty in their professional field of expertise and expanding their knowledge of the interdependencies that characterize the emerging world food system.

ISSUES, GOALS AND STRATEGIES

Five critical issues relating to the mission of the College of Agriculture and Life Sciences have been identified. Specific goals relating to each of these issues are outlined below. A section of this report presents strategies for reaching each of the goals that have been selected. An overriding factor for each critical issue and goal is a commitment to quality programs.

Critical Issue #1
Strengthening the Scientific Information Base

At the heart of the land grant college system is the advancement of knowledge through research. The North Carolina Agricultural Research Service has primary responsibility for strengthening the scientific information base on which a modern agricultural system and improvements in family and community life in the state depend. Effective research programs rely heavily on attracting and supporting bright, well-prepared graduate students to engage in collaborative research with highly qualified faculty members.

Goal A. Attract and retain outstanding faculty and staff.

1. Increase number of distinguished professorships.
2. Expand opportunities for professional growth and development.
3. Provide suitable office and laboratory facilities.
4. Encourage appropriate consulting assignments and support professional travel.
5. Develop career ladder and competitive salary structure for staff.
6. Increase opportunity for hiring staff above the entry level.

Goal B. Strengthen the biological sciences.

1. Increase understanding of molecular, cellular, and structural biology.
2. Advance biotechnology.
3. Enhance ongoing programs in human, animal, and plant nutrition, ecology genetics, physiology, and toxicology.
4. Advance scientific knowledge of biological materials including food,

fiber, and water.
5. Strengthen bridge with the College of Physical and Mathematical Sciences.

Goal C. Develop plant and animal production, processing, and marketing systems.

1. Strengthen bridges between biological disciplines, plant and animal sciences, and the College of Veterinary Medicine.
2. Enhance the utilization of new genetic technologies in plant and animal improvement.
3. Identify new pest management systems.
4. Develop cost-effective production, harvesting, and processing technologies.
5. Design computer models for systems analysis and for production and marketing decisions by firm managers.
6. Design and develop expert systems and sensor technology.

Goal D. Develop improved natural resource management systems.

1. Integrate agricultural systems with environmental systems.
2. Develop management systems for use of water resources.
3. Interact with the College of Forest Resources to improve forest resource management systems, wildlife, and recreation resource management systems.
4. Interact with the College of Physical and Mathematical Sciences to enhance coastal and estuarine resource management.

Goal E. Provide research base for human resource development.

1. Understand human relations and stress management systems.
2. Improve knowledge of nutritional status of people as it relates to health.
3. Improve research base for youth development education.
4. Increase understanding of biological and societal effects of aging.
5. Develop new insights concerning family structure and resources.
6. Strengthen bridges with the Colleges of Humanities and Social Sciences and Education and Psychology.

Goal F. Broaden rural community resource base.

1. Develop an understanding of social structures that aid adjustment to changing technology.
2. Improve community services delivery systems.
3. Evaluate alternative local government investment strategies.
4. Strengthen bridges with the Colleges of Humanities and Social Sciences, Engineering, and Textiles and the School of Design.

Critical Issue #2
Expanding Scientific and Socio-Scientific Literacy

The transfer of information through formal and informal networks linking the scientific community with the citizens of the state provides the base for development of new opportunities for social and economic progress. The North Carolina Agricultural Extension Service is a lead agency for information transfer to individuals and communities. Ability to adapt to changing conditions in North Carolina, an integral part of an evolving world economy, rests on an understanding of technological advances and an appreciation for the methods by which such advances may be used to improve the quality of life. Efficient and effective interactions between the agricultural industry and the general public depend on a clear understanding by both groups of the needs and constraints facing the other.

Goal A. Foster integration of research and extension functions.

1. Encourage joint appointments and collaborative activities, where appropriate.
2. Increase frequency and scope of interdisciplinary program activities.
3. Enhance technology transfer and dialogue among research and extension faculty.

Goal B. Provide life-long learning through university outreach.

1. Improve capacity of rural and urban decision-makers to respond to changing environment.
2. Increase opportunities for formal, continuing study by adults in agriculture, the life sciences, and social sciences.
3. Focus on ability of youth to contribute to community well-being.
4. Increase cooperative educational programs with the College of Humanities and Social Sciences, and University Extension.

Goal C. Expand use of high technology communication systems.

1. Provide links between laboratory and field computer data systems.
2. Develop improved methods and networks for transfer of new knowledge.

Critical Issue #3
Enhancing Environmental Quality, Health and Well-being of Citizens

While strengthening the economy through efficient production, management, and marketing, it is important to provide a safe environment and protect our natural resources. Efficient use of water resources is critical to agricultural production, economic growth, and the health of citizens.

North Carolinians are experiencing sweeping economic and social change. These changes have been accompanied by changes in family structure, and on occasion by child and parent abuse, substance abuse, and by financial distress. Mortality rates in North Carolina for heart disease, strokes, and diabetes are above the national average. Other health problems are closely related to diet and exercise. Health professionals point to stress as a major family concern. Primary youth concerns are health and safety issues. These include childhood accidents, teen pregnancy, school drop-outs, substance abuse, family stability, and juvenile delinquency.

Research and educational programs here and at the University of North Carolina at Greensboro (UNC-G) are needed to help people successfully address these issues and to take advantage of knowledge that will improve their lives. The work of volunteers can play an important role in providing the leadership skills needed.

Goal A. Identify the impact of social, economic, and structural changes on families and communities and strengthen family and community resources available to manage change.

1. Improve the skills and abilities of families and communities to identify and manage money, time, and physical and community resources.
2. Assess the effectiveness of alternative group and community responses for mitigating the impact of family stress and economic uncertainty.
3. Measure the consequences of structural changes, emerging technologies, and public policies on family stability, community growth, and economic diversity.

Goal B. Improve nutritional and health status by improving food quality and safety, determining bio-availability of nutrients and understanding dietary practices.

1. Develop techniques to measure the microbial, chemical, and nutritional quality of foods.
2. Develop and define processes which will provide high quality (i.e., nutritional and sensorial), safe (i.e., microbial and chemical), and convenient foods.
3. Develop methods and messages to enhance consumer's knowledge of safe handling practices and understanding of their food supply so they can make informed risk/benefit decisions.
4. Develop educational programs to bring about changes in dietary habits and lifestyle to reduce the risk of obesity, health problems, and chronic disease.

Goal C. Develop an understanding of the effects of interactions between drinking water quality and human health.

1. Determine the impact of water quality on household use, health, and consumer practices.
2. Deliver appropriate educational programs relating to water usage and safety to rural and urban residents, local government officials, and food processors.

Goal D. Provide research and educational programs for users of agricultural and laboratory chemicals and develop policies for safe use.

1. Determine the fate and impact of environmental additives.
2. Enhance support for existing programs to optimize use of pesticides and nutrients and to conserve and properly manage natural resources.
3. Release only genetically engineered organisms that are compatible with the safety and stability of the environment.
4. Apply the concepts of integrated pest management to use of environmental additives.
5. Improve waste technology for agricultural and other industries.

Goal E. Improve skills of volunteer leaders to affect family decisions and public policy.

1. Identify and provide training for individuals having potential community leadership skills.
2. Provide information for use by community leadership relating to current issues, decision making methods, and political processes.

Critical Issue #4
Improving the Competitiveness of North Carolina Agriculture and Business Communities

The long-term profitability of North Carolina agriculture depends upon the ability of producers and processors to maintain competitiveness in a local, regional, and global economy. Profitability of agribusiness depends upon technological competitiveness in these areas and on the ability to recognize, understand, and respond quickly to consumers' needs and desires. The potential for profit hinges on economically efficient production, processing and marketing systems, and supportive agricultural, macroeconomic, and international trade policies. New technologies, marketing strategies, and institutional arrangements need to be integrated into farming and business systems. Alternative and innovative uses of agricultural and natural resource products, including industrial and non-food uses, may enhance competitiveness.

The well-being of rural communities is closely linked to the performance of the agricultural sector. The financial stress in agriculture, coupled with a lack of economic diversification, has caused a crisis in some rural communities. Local economies no longer offer adequate alternatives to displaced farmers and can ill afford the retail and service job losses accompanying agricultural adjustments. Losses of manufacturing jobs and the decline in tax base and revenues have contributed to a decline in public services and quality of life in many rural communities.

Goal A. Develop, test, and transfer new technologies and products.

1. Develop management decision models and expert systems which integrate disciplines.
2. Intensify interdisciplinary research and improve information delivery methods and networks.

3. Accelerate the discovery, assessment and adoption of profitable technology.

Goal B. Improve product quality for domestic and foreign markets.

1. Accelerate development of technologies for production and processing of new and improved food and fiber products.
2. Assist in the discovery and adoption of quality control technology.
3. Enhance understanding of the global market environment.

Goal C. Manage natural resources for increased income and environmental protection.

1. Enhance understanding of multiple uses of natural resources.
2. Assist in evaluating alternative resource policy strategies.
3. Identify investment and entrepreneurial opportunities.

Goal D. Develop a leadership cadre with knowledge and skills for solving business, community, and policy problems to speed economic development.

1. Conduct policy education programs for decision-makers, leaders and elected officials.
2. Expand number and improve educational support for community leaders.

Goal E. Strengthen business and community support systems and develop viable infrastructures.

1. Deliver timely, accurate information to clientele.
2. Identify new employment opportunities including alternative agricultural enterprises, off-farm jobs, home-based industries, and expansion of rural services to improve family incomes and provide community growth.
3. Develop integrated production, financial, and marketing decision systems for agriculture, agribusiness and communities.
4. Provide guidance and leadership in the development of consistent and effective fiscal, monetary, trade, and agricultural policies and in understanding the consequences of alternatives.
5. Strengthen public decision-making process through improved management systems and use of strategic planning.
6. Improve cost effectiveness of government in the delivery of community service.

Goal F. Improve clientele's understanding of North Carolina's role in the global economy.

1. Help industries to better understand the global environment in which their products compete with those from other regions and countries.
2. Assist processors and marketing firms to select products and marketing strategies that will improve their ability to compete on national and world markets.

3. Increase awareness on the part of community leaders and the public at large of the increasing interdependence among trading regions and nations as it impacts on prospects for growth in the state.

Critical Issue #5
Providing Leadership in Agriculture and the Life Sciences

Strong and capable leaders are needed to resolve the complex issues raised by technological, economic, social, and political changes that can be expected in the future. An understanding and direction of the forces for change requires an informed citizenry in an increasingly complex, technologically oriented society. The CALS provides an opportunity for able students to gain the skills needed for positions of leadership in professional and community life.

Goal A. Recruit and increase retention of outstanding students.

1. Revitalize recruitment information describing the scope of opportunities in CALS, emphasizing science and technology, and preeminence as a research, teaching, and public service institution.
2. Utilize the 4-H and youth component of Extension and campus recruitment teams, including students, to encourage high school students to pursue a career in agriculture, life sciences, and social sciences.
3. Provide additional financial incentives through merit-based scholarships and need-based assistance.
4. Expand opportunities for recognition of excellence including merit scholarships, graduate fellowships, and other highly visible merit recognition programs.
5. Enhance programs designed to retain qualified students.

Goal B. Improve quality of academic offerings.

1. Instill in students basic technical and professional competencies.
2. Strengthen academic curricula, including the Agricultural Institute, four-year baccalaureate and graduate programs.
3. Expand opportunities for non-CALS students to become familiar with the biological sciences and modern food systems.
4. Expand opportunities for CALS students to understand better societal structure and its interaction with agriculture and the life sciences.
5. Provide life skills development leading to greater understanding of new technology in an interdependent world through programs such as the residential scholars program and University Studies curricula.

Goal C. Facilitate career preparation and transition.

1. Encourage greater use by students of opportunities for comprehensive assessment and testing services to clarify their career objectives.
2. Assist students in developing individualized academic plans through workshops and faculty advising.
3. Expand the use of internship and co-op programs to assist students in relating their academic programs to employment opportunities.

Goal D. Develop an effective international dimension.

1. Increase understanding by the citizens of North Carolina of the opportunities for gaining new knowledge about food and fiber crops through collaborative international research, extension, and education programs.
2. Improve the ability of students to lead successful careers in a global economy through international travel, study, and short-term employment abroad.
3. Provide international experiences for faculty and selected leaders in the state.
4. Provide opportunities for citizens of other countries to interact with faculty and participate in leadership training programs.
5. Clarify Extension's role in the international dimension and build support among clientele for any such involvement.

Goal E. Provide opportunity for life-long learning.

1. Increase the opportunity for people to update their technical knowledge through directed independent study and on-campus evening courses.
2. Offer off-campus credit courses and short courses focusing on agriculture and the life sciences.
3. Develop outreach programs on contemporary issues.
4. Strengthen linkages with other universities and community colleges in the state.

CONSTRAINTS ON THE COLLEGE OF AGRICULTURE AND LIFE SCIENCES

Building on the critical issues, goals and strategies identified earlier, this section describes the most serious constraints limiting the effectiveness of CALS to implement the proposed actions.

1. Physical Facilities and Equipment

A. Research Space:

More research laboratories are urgently needed and existing laboratories need to be expanded. An improved system is needed for the allocation of existing space. The CALS administration must arrive at a fair set of priorities for allocating space for active versus static or senescent research programs.

Modernization of many existing laboratories to meet federal and state standards, especially for molecular biology, is critical and should be funded by NCSU. Many research facilities were constructed before the advent of current federal and state standards. As a result, they lack such things as fume hoods and adequate bench space. The lack of facilities that meet NIH, OSHA, and related regulations is a serious constraint to receiving federal funding and to CALS's general competitiveness.

A critical need is the immediate development of modern, on-campus, small animal facilities. The absence of such facilities stymies attempts to hire new faculty and develop research programs at the frontier of animal biotechnology, such as mammalmian recombinant DNA research and embryo transplant technology.

B. Teaching Space:

New and better equipped lecture halls are needed for teaching.

Laboratory space for teaching undergraduate and graduate molecular biology and biotechnology courses is desperately needed. The absence of such laboratory space for teaching biotechnology courses is the major stumbling block in the development of an adequate academic program in this area.

C. Extension Facilities:

The construction of a new agricultural communications building and the subsequent renovation of space in Ricks Hall is needed for the rapid dissemination of knowledge and technology to clientele groups. Overcrowded space and the inability to incorporate new communications equipment into inadequate space slows the modernization of CALS information delivery system.

D. Office Space:

Additional office space is badly needed for new faculty, emeritus faculty and visiting scientists. Further, many departments do not have office space for graduate students and postdoctoral researchers. Students and researchers often have their desks within laboratories. This practice is hazardous in addition to taking up already critical amounts of laboratory space. Additional space is also needed for support personnel such as secretaries, technicians, specialists, and analysts.

In addition to the need for increased total space, there is a critical need to physically consolidate departments and related faculties. Currently many departments are distributed over several locations (some by design, others not). Such physical divisions greatly hamper communications, intellectual interactions, and productivity. Operational costs are increased through the need for duplication of facilities, personnel, and services.

F. Equipment:

Few classrooms or laboratories are presently equipped to permit televideo or computer-based instruction. Teaching techniques are thus limited to traditional methods which make it difficult to take advantage of advances in field and laboratory technology. The use of mobile teaching equipment is constrained by the distances between buildings, the lack of elevators to move equipment from loading dock to classroom, by random assignment of courses to classroom space, and by lack of qualified personnel to assist faculty in setting up instructional equipment.

Research equipment is in constant need of repair and replacement. State-of-the-art equipment is expensive but necessary for maintenance of CALS' position at the cutting edge of science. Securing funds to obtain new and replace aging/obsolete scientific equipment and instrumentation poses a major problem for CALS project leaders. The CALS should assume a primary responsibility and take an active leadership role in identifying and securing these funds.

2. Faculty

A. Morale:

A positive image needs to be developed throughout the University, General Assembly, and the citizens of the state that NCSU's quest to become a "University of Excellence" and our role as the "People's University" are completely compatible.

An increased role by the faculty is needed in decision-making processes in CALS. An example is increased participation by CALS faculty in research decisions. The latter could be facilitated by development of a college

research committee made up of researchers, department heads, and a research administrator. This committee would make recommendations to the administration in the general area of research policy and provide an increased role for the faculty in decision making processes.

B. Faculty Development and Enhancement:

Resistance to change must be lowered, including acceptance of strategic planning and visionary leadership. Faculty should be more aggressive to take advantage of the off-campus-leave policy. The system is flexible and provides for short term (up to six weeks) and long term (over six months) leaves. A more effective means of fostering continuous self-education and personal renewal opportunities are needed on the campus.

The College must stimulate tenured faculty through a more aggressive program for short and long-term study leaves. Monetary incentives must be included. A review of the tenure policy is in order. Support and space should be assigned according to productivity.

CALS needs to make more efficient use of faculty visitors to the campus who provide an infusion of new ideas and technologies. Greater use of internships and exchange programs with business firms should be explored.

A reward system for national and international activities should be developed. These are critical in gaining a world class reputation.

C. Recruiting:

The quality of a university is clearly a function of the quality of its faculty and students. A university striving to become a "world class institution" must have as one of its top goals the recruitment of the best minds available for its faculty and student population. Hence, more

attention must be paid to this activity at the college level. In terms of faculty, the College must be prepared to recruit widely and aggressively at all levels to employ the best applicants. The College must offer attractive positions which include competitive "setup" packages to enable scientists to quickly develop on-going teaching, research, and extension programs.

While NCSU is a state-supported university, it must recruit graduate students on a national and international basis. Because NCSU is not as old and venerable an institution as some, it must become more competitive in recruiting top-quality graduate students. This requires the timely availability of funds for graduate assistantships from all sources including foundations. Additionally, recruiting efforts must bring the best applicants to the campus for interviews. It also requires, in some instances, interdepartmental cooperation to provide graduate programs which are especially attractive to the brightest students.

To be competitive for the best and brightest graduates, the University must pay competitive stipends. Unless the student is coming to a university to work with a specific faculty member, the burden of a low stipend from an institution provides sufficient reason to discourage the best and brightest students from enrolling here.

D. Consulting Policy:

University faculty are employed to seek, gather, develop and disseminate information of benefit to the people of North Carolina, the nation, and the world. Consulting should be considered as a service in that it provides a high level of expertise to clientele who desire detailed attention to their own special proprietary problems.

Many clientele groups are composed of large, technically proficient staffs that do not avail themselves of traditional extension information delivery methods. To these clientele, availability of discrete technical expertise is a valued public service. The client benefits from this relationship by being relieved of ongoing salary and benefit demands.

The faculty member and University also benefit from appropriate consulting arrangements. The faculty member derives practical experience which may be applied to future research, extension, and teaching endeavors at the University. Consulting is a viable method of developing and retaining outstanding faculty with technical expertise which may not be retained at normal faculty salary levels. This opportunity should be equally available to all faculty in CALS.

The amount of time allowed for consulting should be based on the productivity and balance exhibited by individual faculty. The present annual guideline of 24 days plus personal time (CALS Policy Memo #10) should be permissible for all faculty demonstrating acceptable productivity and quality in job performance. Other colleges at NCSU have more liberal policies which permit up to 4 days per month plus personal time. Annual review of job performance and appropriate use of the merit pay system would insure balance.

E. Patent Policy and Industry Relationships:

There is a need for better understanding of the potential conflict between research leading to patents and proprietary information and the goal of free interchange of ideas and the products of university research. The faculty is embroiled in the conflict between timely publication of data and

the uncertainties of patent application and delayed publication. It is unclear whether patents issued do or should carry the same weight as a journal series paper. A CALS policy should be developed to define the role of faculty in the patent process, the credit given for such efforts, and to resolve the conflicts that arise from delayed or absent publications.

F. Travel Policy:

More funding and opportunities for travel for faculty, graduate students, and staff would expand national and international professional interchange and enhance the image of the College in the scientific community.

3. Support Groups.

A. Technical Support Staff:

A major constraint on research in CALS is the lack of a flexible classification system, lack of a career ladder, and inadequate salary levels for the technical staff. Competition for hiring and retention of the technical support staff is intense in the Research Triangle and NCSU is not competitive under present conditions. Unfortunately, NCSU provides training for technicians and programmers who soon move to private industry in the Research Triangle for salaries considerably above what NCSU is paying.

As with the technical support staff, improved classifications and salaries for clerical employees are also needed together with better support for retention of key employees.

Efforts to encourage personnel in the NCSU Division of Human Resources to recognize their role as a campus support group should be maintained. CALS should assist Human Resources in the hiring and retention of technical and clerical staff by providing informative suggestions.

Assistance in meeting state and federal safety regulations should be provided by Life Safety Services. CALS should assist Life Safety Services personnel in their role to support campus programs and facilitate regulatory compliance, particularly by encouraging University administration to make funds available for compliance. This group should assist in developing and effectively implementing laboratory and office safety practices and in disposing of identified and unidentified chemicals under the guidance of faculty committees.

B. Information Delivery Systems:

The clientele of the College must be expanded to include the general public — not only as they depend upon agriculture, but also as they impact and are impacted by the life sciences, social sciences, and natural resources. Traditional agriculture is now comprised of many political constituencies.

There is wide variability in the economic status and educational base of clientele groups. Technology for information delivery is changing rapidly, yet CALS often relies on traditional methods. CALS need to evaluate our techniques and assist with the transition to new methods as they are proven to be effective. The College needs to assist departments, particularly in acquisition of the necessary equipment for classroom teaching.

The university telephone system is completely out-dated and is a serious burden. Improved computer networking is needed within departments and between departments and the university system. The lack of flexibility for data transmission and electronic mail is a major problem. New institutional strategies will be needed for support of life-long learning, including new people/communication skills and understanding of group processes.

C. Physical Plant:

The campus requires a more efficient and responsive maintenance operation. As in the case of Human Resources and Life Safety Services, the Division of Physical Plant is a service organization whose role is to support and facilitate the activities of the University. However, services from Physical Plant are slow to appear, and these services are very costly compared to those available from private industry.

The administrative structure of Physical Plant is insensitive to the needs of the campus research community. For example, there is little apparent planning, prior notification, and coordination in shutting off steam, electricity, and other services. This has a severe impact on plant and animal growth chambers and on-going experiments of every sort.

D. Purchasing System:

There is a need for more rapid and efficient processing of purchase orders, especially between the campus and state offices. Often program needs and grant funding opportunities are such that long range planning is not possible. Expeditious processing of purchase orders is necessary to deal with short notification of funding. Additionally, faculty and staff need continual orientation and training about purchase procedures to avoid last minute requests which are impossible to meet.

The individual purchasing officers have considerable information at hand regarding firms with lowest prices, and those with contracts for scientific equipment and supplies. This information should be more readily available to individual departments and their purchasing clerks to facilitate ordering activities.

4. Resident Student Body

A. Undergraduate Students:

The College of Agriculture and Life Sciences is encountering severe competition in recruiting and retaining qualified undergraduate students. This situation has developed partly as a result of fewer young people, a misunderstanding among high school students about the opportunities in agriculture and life sciences, and CALS' rapidly changing clientele.

The typical high school graduate in North Carolina is more likely to be from an urban area and perhaps not well versed in career opportunities available to students in CALS. They tend to associate NCSU with traditional agriculture, realizing that NCSU and CALS have exceptional strengths in the life sciences and fundamental science as it relates to agriculture. Thus, some students choose other institutions which are perceived to emphasize science and high technology careers more than CALS. These changes have resulted in very serious declines in numbers and quality of students in the traditional agricultural disciplines.

The educational opportunities for the more limited number of able, incoming college students have increased dramatically in recent years. Unfortunately, colleges of agriculture generally have had relatively ineffective educational and recruiting programs at the high school level. As a result, numbers of graduates from these colleges continue to decline. These problems are especially acute with minority students.

Currently, the average student entering curricula in traditional agriculture is less academically inclined than their counterparts in the life sciences. A high percentage of the students in the life science departments

are outstanding scholars.

B. Graduate Students:

The declining numbers of students receiving undergraduate degrees in agriculture and related disciplines are reflected in graduate student enrollments in most programs in CALS. The competition for the restricted pool of outstanding applicants has increased greatly during the last 4 or 5 years. For example, more than half of the CALS stipend offers with university ($1,000) or alumni ($2,000) supplemental stipends were not accepted in 1987. In contrast, about two-thirds of these offers to exceptional applicants were accepted in earlier years. With graduate students conducting a significant portion of the research in CALS, this decline will have a serious impact on CALS.

C. Program Constraints:

The need for expensive equipment and congested laboratory facilities limit the number of students who can be served. Lack of equipment in classrooms limits use of TV/video teaching materials and other advanced instrumentation techniques. Disciplinary boundaries constrain development of comprehensive undergraduate programs.

5. Extension Clientele

A. Participants:

The changing structure of agriculture is leading to fewer but more complex commercial farms. Meanwhile the number of part-time farms is increasing. Large farms and agribusinesses require levels of expertise that

are sometimes beyond the capacity of some county extension agents to deliver. Many agribusinesses operate in national and international markets and at times bypass the College to seek professional services elsewhere. Increasing numbers of family members have part-time or full-time jobs which limit the hours when they may participate in extension programs.

B. Programs:

The slow incorporation of new decision-making and communications technologies such as microcomputers, electronic mail, satellite TV, and video tapes hinders the information transfer and adoption process. A systems approach to agricultural production and marketing, including multi-disciplinary issues in the biological sciences, requires even greater coordination among extension specialists and researchers than has been common in the past.

6. Administration and Planning

A. Programming:

Effective reallocation of resources and management of interdisciplinary activities is often hindered by "turf protection" associated with existing structures. Departmental administrative styles may restrict creativity of individual faculty members and their interactions with faculty in other departments.

Interdisciplinary or cooperative activities must be recognized and rewarded just as scholarly activities within departments are rewarded.
A second concern is the perceived lack of real support for interdisciplinary programs. There is a lack of effective interaction between commodity and basic science departments (e.g., programs to integrate molecular genetics and

plant/animal breeding). Effective interdisciplinary programs are needed to circumvent this perception.

The College has several interdepartmental or shared research facilities, e.g., the protein and nucleotide sequencing and monoclonal antibody facilities, mycotoxin laboratory, pesticide residue laboratory, etc. These facilities are widely used by faculty in many different departments. However, the departments that administer interdisciplinary programs carry the burden for maintaining these facilities, such as paying the maintenance contracts and/or repair costs on the equipment. A more equitable system is needed to maintain these facilities and assure availability of excellent facilities to all.

The campus-wide biotechnology program is not as effective as it could be. Part of this may stem from the lack of well-established leadership and goals. Since much of the thrust in biotechnology lies within the framework of the present CALS, a conscious effort is needed by CALS to have a single person responsible for coordinating the various components of the program.

B. Departmental Operations:

A CALS system of electronic bookkeeping is needed to facilitate record-keeping and purchases. There is also a need for in-service training and additional administrative assistance for departments to improve operations, manage contracts and grants, and facilitate program management.

C. Allocation of Funds and Assessment of Fees:

More flexibility is needed to redirect resources to support adequately areas critical to specific CALS programs. This is especially important in equipment procurement, replacement, and maintenance.

The collection of sales tax on university purchases is inappropriate as are certain service charges within the University. Return of overhead often appears to be inequitable and contrary to stated programmatic goals.

D. Assistance with Grant Preparation:

Additional assistance is needed in the development of external funding proposals. This might include a newsletter to faculty announcing requests for proposals and coordination between departments, NCARS, and the university research office in timely development of quality proposals. The University often competes with firms and agencies having a full-time staff responsible for preparation of grant applications. Such assistance is needed for the special needs of extension, academic affairs and research.

PRIORITIES AND RECOMMENDATIONS

Faculty

> Expand opportunities and increase financial support for faculty renewal through study leaves, off-campus scholarly assignments, and training programs.

> Enhance appreciation of and rewards for excellence in teaching, research, extension, advising and administration.

> Provide opportunities for faculty members to gain international experience.

> Encourage appropriate national, international, and consulting assignments and support professional travel.

> Increase the number of distinguished professorships and increase opportunities for hiring above the entry level.

> Increase the number of visiting faculty, both short-term and long-term, and post-doctoral students to complement permanent faculty resources.

> Make greater use of skills of selected senior and emeriti faculty members through permanent part-time appointments of appropriate tenure for certain faculty members as they qualify for retirement.

> Increase number of permanent non-tenure track positions for technical support personnel and provide for continuity in appointments from research associate through research professor.

Physical Facilities

> Develop all major facilities across department lines. Each facility should be planned as a package with space, equipment, installation, renovation, technical support, and faculty requirements integrated.

> Provide adequate contiguous space for departments and closely related programs.

> Enhance joint use of costly equipment and support personnel through establishment of selected "Centers" comparable to Computer Center and Phytotron. Examples include x-ray crystallography and protein engineering facilities.

> Develop a servicing center (computer center model) to reduce down time of expensive equipment or solicit bids for a contracting service.

> Provide funds for new and replacement laboratory and field equipment.

> Provide minimal space for active emeritus faculty and scholarly visitors

as a means of enhancing the productivity of permanent faculty.

Support Services

- Increase use of computer, video, and other new communication technologies to enhance transfer of information.
- Provide computer development assistance through software design, modeling assistance, and support services for research, teaching, and extension programs.
- Develop centralized data centers and library facilities with computer accessibility to multiple campus and field locations.
- Develop improved networks linking CALS to private groups and public agencies throughout the state to expedite transfer of new information.
- Expand information services to farmers and agricultural businesses including domestic and foreign market developments.
- Modernize accounting, purchasing, and telephone systems.
- Establish department administrative assistants (office managers).
- Adopt a formula for minimum secretarial and technical support staff.
- Establish university-specific job descriptions and salary levels for support personnel in conjunction with NCSU Division of Human Resources.

Administration and Planning

- Develop a system to facilitate and recognize interdisciplinary programs and cooperative efforts.
- Establish multidisciplinary research teams with extension faculty links to strengthen ongoing systems modeling work.
- Establish multidisciplinary research teams to develop plant and animal production systems which optimize available fixed and variable inputs including soil, water, and capital. Evaluate the most efficient administration of such teams.
- Designate a biotechnology administrator to provide leadership and coordination within CALS.
- Establish a CALS grants office to facilitate scientific information generation through enhanced external funding for research, extension, and teaching efforts.
- Maintain competitive graduate assistantship stipends and assist with

timely notification of graduate stipends or supplements from all sources so that these will be useful in recruitment of the most outstanding students.

> Develop a mechanism for faculty actively involved in research to participate in the development of research policy and direction and to rank intramural proposals. This could be accomplished through a college research committee of faculty, department heads, and a research administrator.

> Recommend changing the name of NCARS to more appropriately reflect the broad mission of CALS.

> Form new non-commodity clientele groups to expand constituencies for CALS programs.

> Form recruiting teams to work closely with high schools to improve the flow of information concerning the scope of CALS two-year and four-year programs.

> Utilize more effectively the state-wide outreach of the 4-H program and total extension program to develop recruiting links.

> Incorporate international dimensions in ongoing CALS programs and emphasize international dimensions of the North Carolina economy among leaders in the state.

> Include presentations at CALS faculty meetings on both specific research, extension, and teaching programs and the overall orientation or program within a given department.

> Develop a mechanism to set new project priorities and redirect resources through early retirement, negative salary adjustments, and sabbaticals.

> Select replacement appointments to guarantee a diversity of age and rank to provide continuous replacement and infusion of new ideas.

> Establish a long range planning committee in CALS to address recruitment, retention, facilities, space, etc.

Program Directions

Critical Issue #1: Strengthening the Scientific Information Base

> Continue to develop basic and applied science to support improved production and processing systems.

> Enhance programs in molecular, cellular, and structural biology, physiology, and nutrition.

- Develop research programs that use molecular technology to incorporate improved protein, oil, and other chemical constituents into crops to enhance utilization and marketability.

- Develop and fund research teams including basic molecular biologists and plant and animal breeders with specific goals to improve efficiency, yield of desired products, and improved chemical composition.

- Maintain and enhance fundamental science programs in applied departments.

Critical Issue #2:
Expanding Scientific and Socio-Scientific Literacy

- Strengthen the relationship between the university and state-wide youth development program, using 4-H programs as the primary youth outreach effort of CALS.

- Incorporate sufficient social science and humanities courses in undergraduate curricula to assure well-balanced programs of study.

- Strengthen life-long learning opportunities for the non-academic scientific community.

- Strengthen efforts to acquaint the general public with the goals and methods of the agricultural production system and with constraints facing that system.

Critical Issue #3:
Enhancing Environmental Quality, Health, and Well-Being of Citizens

- Develop, test, and deliver improved, profitable plant and animal management systems and processing procedures which optimize the use of chemicals and nutrients, minimize erosion, and reduce movement of pollutants to products, water, and air.

- Develop computer-assisted decision models for use in various aspects of agricultural production, protection, and processing to control pathogens and pests, minimize environmental impacts, and optimize production and processing.

- Identify, develop, and implement new pest management systems.

- Develop means to conserve, recondition, and recycle water.

- Address environmental impact of organic loads in effluent water and mechanisms for municipal systems to handle effluent.

Critical Issue #4:
Improving the Climate for and Competitiveness of North Carolina Agriculture and Business Communities

> Develop total crop and animal production systems and processing procedures that optimize short and long term profits through improved integration and application of production, management, protection, processing, and marketing strategies.

> Develop cost-effective production, harvesting and processing technologies.

> Improve capabilities at the production-processing-marketing interfaces.

> Use traditional, emerging, and new technologies to improve yield, quality, storage, processing, protection, and utilization of existing and new agricultural commodities.

> Design computer models for systems analysis and for production, processing, and marketing decisions by firm managers.

Critical Issue # 5:
Providing Leadership in Agriculture and the Life Sciences

> Develop a marketing plan for CALS and its programs as an aid in aggressive student recruiting.

> Expand the use of minor programs and add new capstone and honors courses.

> Enhance professional competencies of students in the use of computers, communication, and interpersonal skills, ethics, and critical thinking.

> Address issues important to the people of North Carolina through structured review and updating of courses.

> Recruit faculty with new ideas and strengthen current faculty evaluation procedures.

> Broaden the leadership and support base to include new non-commodity clientele groups.

Table 1. Expenditures by Function, College of Agriculture and Life Sciences, 1979-88

Fiscal Year	Academic Affairs	Research Service	Extension Service	Total Actual $	Total Constant $*
1979-80	$5,814,551	$30,104,800	$24,047,967	$59,967,318	$59,967,318
1980-81	7,278,844	34,084,340	27,551,638	68,914,822	61,641,164
1981-82	7,956,031	37,680,814	29,178,005	74,814,850	61,830.454
1982-83	8,062,427	38,967,235	29,363,170	76,392,832	60,341,889
1983-84	8,633,414	42,917,967	31,218,704	82,770,085	63,038,907
1984-85	10,197,573	46,111,889	33,429,401	89,738,863	65,790,955
1985-86	11,253,969	48,768,643	36,123,981	96,128,593	68,565,330
1986-87	12,253,358	50,247,963	37,708,627	100,209,948	69,541,943
1987-88**	12,675,555	53,461,972	40,376,085	106,513,612	71,246,561
% Change 1979-88	118	78	68	78	19

* Actual dollars adjusted to change in the Consumer Price Index, 1979-88.

**Projection based on actual expenditures for first nine months of fiscal year.

Table 2. Expenditures by Functions, 1979-88
Academic Affairs, College of Agriculture and Life Sciences

Fiscal Year	Four-Year Program	Agricultural Institute	Organized Research	Total Actual $	Total Constant $*
1979-80	$5,142,277	$642,673	$ 29,601	$5,814,551	$ 5,814,551
1980-81	6,522,541	715,914	40,389	7,278,844	6,510,594
1981-82	7,058,053	772,657	125,321	7,956,031	6,575,232
1982-83	7,234,171	770,982	57,274	8,062,427	6,368,426
1983-84	7,636,849	819,884	176,681	8,633,414	6,575,334
1984-85	8,887,103	882,912	427,558	10,197,573	7,476,226
1985-86	9,903,044	944,813	406,112	11,253,969	8,027,082
1986-87	10,482,938	1,004,925	765,495	12,253,358	8,503,371
1987-88**	11,120,446	1,050,557	504,552	12,675,555	8,478,632
% Change 1979-88	116	63	1604	118	46

* Actual dollars adjusted to change in the Consumer Price Index, 1979-88.

**Projection based on actual expenditures for first nine months of fiscal year.

Table 3.

Sources of Funds Expended, 1979-88
North Carolina Agricultural Extension Service

Fiscal Year	Federal Funds	State Funds	Grants & Contracts	All Other*	Total Actual $	Total Constant $**
1979-80	$10,721,052	$12,284,251	$ 508,457	$ 534,207	$24,047,967	$24,047,967
1980-81	12,060,670	14,143,682	681,834	665,452	27,551,638	24,643,683
1981-82	12,280,553	15,480,716	659,904	756,832	29,178,005	24,114,053
1982-83	12,139,016	15,716,516	658,053	849,585	29,363,170	23,193,657
1983-84	12,539,569	16,922,349	737,197	1,019,589	31,218,704	23,776,621
1984-85	12,522,882	18,954,625	1,194,052	757,842	33,429,401	24,508,358
1985-86	12,492,406	21,382,393	1,299,430	949,752	36,123,981	25,766,034
1986-87	11,927,170	22,534,549	1,707,074	1,539,834	37,708,627	26,168,374
1987-88***	11,513,975	24,911,327	1,802,855	2,147,928	40,376,085	27,077,414
% Change 1979-88	7	103	255	302	68	13

* Includes miscellaneous receipts, sale of equipment, and foundations.

** Actual dollars adjusted to change in the Consumer Price Index, 1979-88.

***Projection based on actual expenditures for first nine months of fiscal year.

Table 4. Sources of Funds Expended, 1979-88
North Carolina Agricultural Research Service

Fiscal Year	Federal Funds	State Funds	Grants & Contracts	All Other*	Total Actual $	Total Constant $**
1979-80	$4,777,103	$16,109,864	$7,205,331	$2,012,502	$30,104,800	$30,104,800
1980-81	5,160,786	18,630,477	8,101,155	2,191,922	34,084,340	30,486,887
1981-82	5,588,635	20,099,616	9,358,982	2,633,581	37,680,814	31,141,168
1982-83	5,806,699	19,891,382	10,581,358	2,687,796	38,967,235	30,779,806
1983-84	5,632,455	22,077,677	12,428,513	2,779,322	42,917,967	32,686,951
1984-85	6,113,189	24,317,843	12,721,574	2,959,283	46,111,889	33,806,370
1985-86	6,448,769	27,105,319	12,158,019	3,056,536	48,768,643	34,785,052
1986-87	5,422,492	29,501,015	11,649,340	3,675,116	50,247,963	34,870,203
1987-88***	5,918,204	31,945,656	12,026,975	3,571,137	53,461,972	35,760,516
% Change 1979-88	24	98	67	77	78	19

* Includes miscellaneous receipts, sale of equipment, miscellaneous prerequisites, overhead receipts, and foundations.

** Actual dollars adjusted to change in the Consumer Price Index, 1979-88

***Projection based on actual expenditures for first nine months of fiscal year.

Table 5. Enrollment by Class, College of Agriculture and Life Sciences, 1979-87

Class	Fall Semester 79	80	81	82	83	84	85	86	87	% Change 1979-87
Undergraduates	2,363	2,430	2,398	2,588	2,635	2,704	2,557	2,481	2,431	+03
Freshmen	640	758	770	957	815	837	782	856	814	+27
Sophomores	537	546	577	606	762	703	673	606	620	+15
Juniors	538	520	490	468	514	611	514	476	485	-10
Seniors	648	606	561	557	544	553	588	543	512	-21
Graduates	735	724	701	707	711	721	725	746	728	-01
Masters	426	412	385	380	368	363	345	371	346	-19
Ph.D.'s	309	312	316	327	343	358	380	375	382	+24
Institute	416	426	399	381	351	288	281	261	234	-44
Undeclared	26	31	24	21	10	8	10	13	8	-69
TOTALS	3,540	3,611	3,522	3,696	3,707	3,721	3,573	3,501	3,401	-04

Table 6. Enrollment by Department, College of Agriculture and Life Sciences, 1979-87

Department	Fall Semester 79	80	81	82	83	84	85	86	87	% Change 1979-87
Animal Science	297	295	282	282	300	305	296	299	276	-07
Bio & Ag Engr	111	122	135	284	300	312	238	183	140	+26
Bio Sciences	136	148	153	167	180	255	270	277	289	+112
Biochemistry	70	66	71	77	101	133	159	186	208	+197
Botany	75	75	56	55	56	56	53	46	42	-44
Crop Science	166	134	123	96	100	78	78	77	62	-63
Dean's Office	457	509	522	545	492	440	422	380	390	-15
Econ & Bus	107	118	101	106	91	128	141	143	144	+35
Entomology	69	83	84	98	94	97	92	86	84	+22
Food Science	135	118	107	109	116	93	94	100	83	-38
Genetics	28	21	24	19	20	22	21	15	19	-32
Hort Science	327	314	246	229	207	192	171	169	161	-51
Interdept	61	84	103	132	147	151	147	128	133	+118
Microbiology	68	64	61	58	56	77	85	91	102	+50
Plant Pathology	47	53	43	48	50	48	41	37	37	-21
Poultry Science	45	31	60	58	55	55	35	36	37	-18
Sociology	59	41	52	55	42	51	49	117	97	+64
Soil Science	94	88	85	89	93	85	65	67	59	-37
Zoology	771	821	815	809	856	855	835	803	804	+04
TOTALS	3,124	3,185	3,123	3,316	3,356	3,433	3,292	3,240	3,167	+01

Table 7. Enrollment by Curriculum, College of Agriculture and Life Sciences, 1979-87
Page 1

Curriculum	Fall Semester 79	80	81	82	83	84	85	86	87
(A) Non-major-Agriculture	131	107	93	86	66	59	77	63	91
(ABM) Ag. Business Mgmt.	-	-	-	-	-	2	53	76	74
(AG) Agriculture	25	18	21	22	15	10	16	14	11
(AGC) Agricultural Economics	11	10	9	8	8	10	12	13	14
(AL) UN in Ag. & Life Sciences	26	30	24	20	15	7	10	13	8
(ANS) Animal Science	30	31	37	28	28	28	29	34	36
(AWB) Wildlife Biology	14	13	11	9	8	7	5	7	7
(BAE) Bio. & Ag. Engineering	34	37	29	25	22	28	35	47	38
(BAS) Business Animal Science	6	3	-	-	-	-	-	-	-
(BCH) Biochemistry	29	28	29	20	27	31	85	183	208
(BEC) Business Agriculture Economics	72	74	61	79	60	83	31	13	4
(BHS) Business Horticultural Science	2	-	-	-	-	-	-	-	-
(BL) Non-major-Life Sciences	74	98	129	160	145	130	89	97	87
(BLS) Biological Science	129	143	144	158	172	239	264	272	282
(BO) Botany	50	55	40	36	39	36	34	33	30
(BPS) Business Poultry Science	3	1	-	-	-	-	-	-	-
(BSB) Bio. Sci., Bio. Chemistry Option	41	38	42	57	74	102	74	3	-
(BSE) Bio. Sci., Entomology Concentration	0	0	1	1	1	0	0	1	0
(BSM) Bio. Sci., Microbiology Option	22	19	23	23	23	39	45	48	54
(BSN) Bio. Sci., Nutrition Concentration	7	5	9	9	8	16	6	5	7
(CS) Crop Science	59	60	69	68	81	70	75	76	62
(ECA) Economics	9	5	4	5	8	15	21	29	30
(ECO) Ecology	7	9	6	6	3	4	3	1	2
(ENT) Entomology	50	56	50	56	47	50	51	53	46
(FS) Food Science	51	42	42	44	47	43	43	50	44
(GN) Genetics	28	21	24	19	20	22	21	15	19
(HS) Horticultural Science	44	49	41	43	42	42	37	36	37
(ISP) Individual Study Program, ALS	3	3	4	3	2	1	1	5	13
(LSC) Life Sciences	7	13	11	4	9	11	8	5	5
(MAS) Marine Science	1	0	-	-	-	-	-	-	-
(MB) Microbiology	46	45	38	35	33	38	40	43	48
(MGA) Mgmt.-Economics Option	0	0	0	0	0	1	2	0	1
(NTR) Nutrition	19	15	18	16	12	12	14	15	17
(PHY) Physiology	20	14	18	25	28	26	29	25	27

(Continued)

Table 7. Enrollment by Curriculum, College of Agriculture and Life Sciences, 1979-87
Page 2

Curriculum	Fall Semester 79	80	81	82	83	84	85	86	87
(PP) Plant Pathology	47	53	43	48	50	48	41	37	37
(PSC) Poultry Science	7	4	8	7	3	4	4	5	5
(RS) Rural Sociology	23	17	17	18	10	9	11	11	12
(SAS) Sci.- Animal Science	199	202	189	207	232	224	217	224	193
(SBA) Sci.- Bio. & Ag. Engr. Program	-	-	-	-	48	50	46	32	23
(SBE) Sci.- Bio. & Ag. Engr. Program	24	34	62	73	7	2	-	-	-
(SBO) Sci.-Botany	25	20	16	19	17	20	19	13	12
(SCO) Sci.-Conservation	43	32	35	30	29	27	17	20	15
(SCS) Sci.-Crop Science	21	16	8	4	-	-	-	-	-
(SDM) Zoology, Pre-Dental, Pre-Med. Opt.	159	184	214	248	293	312	334	304	352
(SEC) Sci.-Ag. Economics	15	29	27	14	15	17	22	12	21
(SEN) Sci.-Entomology	6	2	0	0	-	-	-	-	-
(SFM) Sci.-Fisheries Management	59	47	30	10	3	3	2	1	-
(SFS) Sci.-Food Science	63	66	58	55	57	42	45	42	29
(SFW) Sci.-Fisheries & Wildlife	0	0	40	76	96	92	110	106	96
(SHF) Sci.-Hort. Sci. Floriculture Conc.	0	6	9	6	2	7	4	11	6
(SHO) Sci.-Hort. Sci. Ornamental Hort.	0	5	14	16	6	3	7	7	4
(SHS) Sci.-Hort. Science	43	4	4	3	2	-	-	-	-
(SHV) Sci.-Hort. Sci. Fruits & Veg.	0	6	9	8	7	2	3	4	3
(SJS) Applied Sociology, Criminal Justice	2	1	4	4	3	2	0	19	15
(SOC) Sociology	26	19	22	24	24	34	33	40	42
(SPM) Sci.-Pest Mgmt. Crop Protection	12	17	15	15	14	16	11	7	6
(SPS) Sci.-Poultry Science	28	19	34	34	34	27	12	21	19
(SPV) Sci.-Pre-Vet. Option	194	243	244	253	242	223	222	188	188
(SRI) Sci.-Rural Sociology Internat'l Opt.	1	1	0	0	0	0	0	0	0
(SRS) Sci.-Applied Sociology	7	3	9	9	5	6	5	47	28
(SSC) Soil Science	35	33	35	49	49	46	42	46	44
(SSS) Sci.-Soil Science	16	23	15	10	15	12	6	1	-
(SWB) Sci.-Wildlife Biology	164	158	92	34	14	5	3	-	-
(SZM) Sci.-Medical Technology	74	84	90	115	147	127	88	64	54
(SZO) Sci.-Zoology	251	283	292	266	244	260	247	272	246
(TAA) Tech.-Agronomy Basic Sciences Conc.	0	1	1	9	15	17	20	12	10
(TAB) Tech.-Agronomy Agronomic Business	0	1	6	5	9	10	7	7	7
(TAC) Tech.-Agronomy Crop Production	0	19	30	42	54	53	44	38	27

(Continued)

Table 7. Enrollment by Curriculum, College of Agriculture and Life Sciences, 1979-87
Page 3

Curriculum	Fall Semester 79	80	81	82	83	84	85	86	87
(TAG) Tech.-Agronomy	86	58	46	24	19	8	3	1	-
(TAS) Tech.-Animal Science	62	59	56	47	40	53	50	41	47
(TAT) Tech.-Agronomy Turfgrass Mgmt.	0	5	5	11	10	12	13	12	18
(TBE) Tech.-Agri. Bio. and Agri. Engr.	53	51	44	186	223	232	157	104	79
(TFS) Tech.-Food Science	21	10	7	10	12	8	6	8	10
(THF) Tech.-Hort. Floriculture Conc.	0	50	34	37	30	25	13	8	10
(THL) Tech.-Landscape Hort.	0	73	54	59	69	68	76	82	76
(THO) Tech.-Hort. Sci. Ornamental Hort.	0	47	26	23	27	28	19	14	21
(THS) Tech.-Hort. Science	238	56	35	16	8	1	1	-	-
(THV) Tech.-Hort. Sci. Fruits and Veg.	0	18	20	18	14	16	11	7	4
(TOX) Toxicology	13	25	33	41	46	47	41	32	38
(TPS) Tech.-Poultry Science	7	7	18	17	18	24	19	10	13
(TSS) Tech.-Agronomy, Soil Science	-	-	-	-	-	-	5	6	6
(ZO) Zoology	50	52	46	51	51	49	46	49	49
TOTALS	3,124	3,185	3,123	3,316	3,356	3,433	3,292	3,240	3,167

Table 8. Institute Enrollment, College of Agriculture and Life Sciences, 1979-87

Major	Fall Semester 79	80	81	82	83	84	85	86	87	% Change 1979-87
Agribusiness Management	-	-	-	-	-	-	-	13	22	-
Ag Mechanization & Management	29	37	35	26	23	17	14	9	2	-93
Ag Pest Control	20	23	25	35	24	16	27	19	7	-65
Field Crops Technology	78	77	73	72	68	45	33	22	19	-76
Ornamentals & Lndscpe Tech	53	54	49	48	40	50	44	55	59	+11
Food Process Dist & Service	27	22	25	21	29	23	26	26	22	-18
General Ag	76	57	45	56	47	35	37	31	11	-86
Livestock Mngt & Technology	94	105	100	90	82	69	56	39	40	-57
Turfgrass Mngt	39	51	47	33	38	33	44	47	52	+33
TOTALS	416	426	399	381	351	288	281	261	234	-44

Table 9. Undergraduate Enrollment by Department, College of Agriculture and Life Sciences

1979-87 Fall Semester

Department	79	80	81	82	83	84	85	86	87
Animal Science	267	264	245	254	272	277	267	265	240
Bio & Ag Engr	77	85	106	259	278	284	203	136	102
Bio Sciences	136	148	153	167	180	255	270	277	289
Biochemistry	41	38	42	57	74	102	127	156	181
Botany	25	20	16	19	17	20	19	13	12
Crop Science	107	74	54	28	19	8	3	1	0
Dean Office	425	478	490	519	468	419	398	361	374
Econ & Bus	87	103	88	93	75	102	106	101	99
Entomology	6	2	1	1	1	0	0	1	-
Food Science	84	76	65	65	68	50	51	50	39
Genetics	-	-	-	-	-	-	-	-	-
Hort Science	283	265	205	186	165	150	134	133	124
Interdept	15	46	61	85	104	109	101	87	87
Microbiology	22	19	23	23	23	39	45	48	54
Plant Pathology	-	-	-	-	-	-	-	-	-
Poultry Science	38	27	52	51	52	51	31	31	32
Sociology	10	5	13	13	8	8	5	66	43
Soil Science	59	55	50	40	44	39	23	21	15
Zoology	707	756	758	749	797	799	784	747	748
TOTALS	2,389	2,461	2,422	2,609	2,645	2,712	2,567	2,494	2,439

Table 10. Graduate Enrollment by Department, College of Agriculture and Life Sciences

1979-87 Fall Semester

Department	79	80	81	82	83	84	85	86	87
Animal Science	30	31	37	28	28	28	29	34	36
Bio & Ag Engr	34	37	29	25	22	28	35	47	38
Bio Sciences	-	-	-	-	-	-	-	-	-
Biochemistry	29	28	29	20	27	31	32	30	27
Botany	50	55	40	36	39	36	34	33	30
Crop Science	59	60	69	68	81	70	75	76	62
Dean Office	32	31	32	26	24	21	24	19	16
Econ & Bus	20	15	13	13	16	26	35	42	45
Entomology	63	81	83	97	93	97	92	85	84
Food Science	51	42	42	44	48	43	43	50	44
Genetics	28	21	24	19	20	22	21	15	19
Hort Science	44	49	41	43	42	42	37	36	37
Interdept	46	38	42	47	43	42	46	41	46
Microbiology	46	45	38	35	33	38	40	43	48
Plant Pathology	47	53	43	48	50	48	41	37	37
Poultry Science	7	4	8	7	3	4	4	5	5
Sociology	49	36	39	42	34	43	44	51	54
Soil Science	35	33	35	49	49	46	42	46	44
Zoology	64	65	57	60	59	56	51	56	56
TOTALS	735*	724	701	707	711	721	725	746	728

*Total includes 1 student enrolled in marine science

Table 11. Enrollment by Status, College of Agriculture and Life Sciences, 1979-87

Status	Fall Semester 79	80	81	82	83	84	85	86	87	% Change 1979-87
New Students	792	888	884	1,017	887	927	854	888	863	+09
Freshmen	472	580	571	691	621	597	586	594	580	+23
Transfers	157	171	167	171	137	186	130	140	142	-10
Graduate	163	137	146	156	130	144	138	154	141	-13
Continuing Students	2,247	2,240	2,174	2,236	2,419	2,442	2,384	2,287	2,242	-01
Undergraduates	1,339	1,307	1,228	1,297	1,426	1,467	1,425	1,371	1,362	+02
Transfers	360	362	405	401	428	411	388	336	307	-15
Graduates	548	571	541	538	565	564	571	580	573	+05
Reentering Students	85	57	65	62	49	64	54	65	62	-27
Undergraduates	43	25	36	32	24	43	30	39	38	-12
Transfers	18	16	15	17	9	8	8	14	10	-44
Graduates	24	16	14	13	16	13	16	12	14	-42
TOTALS	3,124	3,185	3,123	3,316	3,356	3,433	3,292	3,240	3,167	+01

Table 12. Percent Female Enrollment, College of Agriculture and Life Sciences, 1979-87

Department	Fall Semester 79	80	81	82	83	84	85	86	87
Animal Science	42	44	43	47	48	54	56	54	54
Bio & Ag Engr	09	06	11	13	12	13	12	08	07
Bio Sciences	53	52	54	53	57	56	53	57	60
Biochemistry	34	41	45	44	48	44	44	48	44
Botany	37	39	45	51	45	45	43	33	40
Crop Science	18	14	12	12	15	17	21	21	21
Dean Office	44	47	48	49	46	42	47	46	48
Econ & Bus	13	20	27	19	15	23	26	31	22
Entomology	32	29	31	30	27	25	28	34	39
Food Science	54	62	60	59	59	60	62	60	60
Genetics	21	24	42	53	60	68	62	67	63
Hort Science	45	46	48	44	40	38	34	37	32
Interdept	28	24	27	23	20	19	27	23	23
Microbiology	53	47	64	52	50	52	49	53	51
Plant Pathology	28	32	28	33	38	40	39	41	43
Poultry Science	27	19	23	31	31	24	23	25	19
Sociology	58	66	69	76	67	65	65	54	63
Soil Science	32	27	24	29	31	25	23	25	24
Zoology	44	42	46	45	44	48	48	52	54
TOTALS	39	40	42	41	40	41	42	44	45

Table 13. Ethnic/Sex Enrollment, College of Agriculture and Life Sciences, 1979-87

Ethnic/Sex	Fall Semester 79	80	81	82	83	84	85	86	87	% Change 1979-87
White female	1,120	1,138	1,173	1,213	1,169	1,197	1,191	1,203	1,212	+08
White male	1,699	1,715	1,621	1,750	1,804	1,813	1,677	1,557	1,495	-12
Am Ind female	2	2	0	4	3	5	8	6	7	+250
Am Ind male	6	5	4	4	3	5	5	2	4	-50
Af-Am female	50	60	79	91	102	113	126	143	129	+158
Af-Am male	42	51	61	77	71	79	70	71	65	+51
Asian female	10	18	14	11	21	27	23	29	25	+150
Asian male	9	16	18	20	24	24	19	28	28	+211
Hisp female	10	11	13	10	12	15	12	14	14	+40
Hisp male	8	14	8	9	14	17	21	21	15	+88
Intl female	38	38	31	21	20	35	33	36	48	+26
Intl male	130	117	101	106	113	103	107	130	125	-04
TOTALS	3,124	3,185	3,123	3,316	3,356	3,433	3,292	3,240	3,167	+01

Table 14. Afro-American Enrollment, College of Agriculture and Life Sciences, 1979-87

Department	Fall Semester 79	80	81	82	83	84	85	86	87
Animal Science	0	0	3	4	8	7	10	11	9
Bio & Ag Engr	3	2	1	15	11	7	6	3	2
Bio Sciences	5	9	15	12	15	19	25	24	21
Biochemistry	3	2	2	5	5	5	15	19	18
Botany	2	5	4	7	8	9	4	3	2
Crop Science	3	1	1	1	2	0	0	0	0
Dean Office	25	23	45	41	26	30	23	20	16
Econ & Bus	3	2	2	0	2	2	4	3	7
Entomology	0	1	2	2	3	5	4	4	4
Food Science	6	17	8	9	8	7	4	4	3
Genetics	1	1	1	0	0	1	0	0	0
Hort Science	1	2	0	0	1	2	1	3	2
Interdept	0	2	1	2	3	2	6	5	4
Microbiology	4	5	2	2	4	4	6	4	4
Plant Pathology	0	0	0	0	1	1	0	0	0
Poultry Science	1	0	1	3	1	1	2	1	1
Sociology	3	3	8	8	5	10	9	14	8
Soil Science	0	1	1	1	2	2	2	1	2
Zoology	32	35	43	56	68	78	75	95	91
TOTALS	92	111	140	168	173	192	196	214	194

Table 15. Average SAT Scores by College, NCSU, 1979-87

New Freshmen

College	79	80	81	82	83	84	85	86	87
ALS	990	970	950	978	978	974	981	971	1006
Design	1090	1110	1050	1044	1053	1057	1077	1095	1086
Education	980	930	910	937	975	1018	996	1018	1034
Engineering	1060	1080	1090	1111	1136	1118	1104	1103	1119
Forestry	1000	980	990	1000	998	1008	999	988	1021
Humanities	930	930	950	947	948	947	960	973	997
PAMS	1040	1040	1000	1081	1050	1054	1043	1063	1075
Textiles	960	960	950	977	984	977	960	941	973
University	1010	1010	1000	1023	1028	1030	1016	1023	1044
Difference ALS/NCSU	-20	-40	-50	-45	-50	-56	-35	-52	-38

Table 16. Mean High School GPA by College, NCSU, 1979-87

College	79	80	81	82	83	84	85	86	87
ALS	3.24	3.17	3.14	3.12	3.17	3.15	3.19	3.08	3.17
Design	3.36	3.45	3.25	3.39	3.38	3.35	3.43	3.44	3.56
Education	3.19	3.20	3.05	3.18	3.26	3.30	3.39	3.47	3.52
Engineering	3.33	3.45	3.55	3.60	3.59	3.53	3.51	3.46	3.52
Forestry	3.13	3.14	3.12	3.15	3.14	3.11	3.22	3.05	3.07
Humanities	3.00	2.97	3.06	2.98	3.10	3.05	3.11	3.08	3.15
PAMS	3.36	3.28	3.29	3.56	3.59	3.39	3.37	3.27	3.40
Textiles	3.11	3.12	3.13	3.13	3.21	3.19	3.11	2.95	3.08
University	3.22	3.23	3.27	3.29	3.34	3.30	3.28	3.22	3.30
Difference ALS/NCSU	+.02	-.06	-.13	-.17	-.17	-.15	-.09	-.14	-.13

North Carolina State University
School of Agriculture and Life Sciences
School of Humanities and Social Sciences
Department of Sociology and Anthropology

Box 8107
Raleigh, N.C. 27695-8107

(919) 737-3180

January 18, 1988

MEMORANDUM

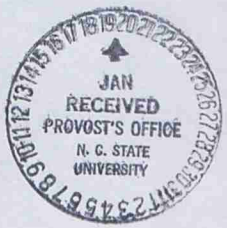
TO: Dr. Lawrence M. Clark
Associate Provost

FROM: Luther B. Otto
Professor and Head

We won't be proceeding with the matter we discussed because of the sensitivities you referred to and the inadvisability of our obligating ourselves to commitments we may not be able to support at some future date.

We are grateful, however, for your willingness to help us out.

LBO:fme



AGRICULTURE AND LIFE SCIENCES
CAPITAL IMPROVEMENT REQUESTS
Academic Affairs

A. 1989-91

1. Life Sciences/Biotechnology Laboratory and Classroom Renovation (Gardner Hall)	$13,400,000
2. Modernization of Classrooms and Laboratories in Gardner Hall, Horticultural Greenhouses, Patterson Hall, Polk Hall and Weaver Laboratories	223,000
3. Animal and Poultry Science Teaching Center	3,000,000
4. Polk Hall Addition	2,500,000

B. 1991-93

1. Kilgore Hall Addition and Renovation	$ 5,881,000
2. Schaub Hall Addition and Renovation	6,000,000
3. 1911 Building Renovation	104,782
4. Horticultural Science Center	2,155,000

C. 1993-95

1. Weaver Laboratory Addition and Machinery Pavilion Renovation	$ 3,105,000

SALS

DEPARTMENT OF ZOOLOGY
NORTH CAROLINA STATE UNIVERSITY

PHONE 737-2741
Campus Box 7617
Raleigh, N.C.
27695-7617

December 4, 1987 Date

TO: Dr. Lawrence Clark

FROM: Bill Grant

Larry,

I would appreciate your comments on my letter.

I'll call later today.

Thanks.

Bill

POSITION ANNOUNCEMENT
Assistant Director
Academic Affairs
School of Agriculture and Life Sciences
North Carolina State University

DESCRIPTION

The Assistant Director is responsible to the Associate Dean and Director of Academic Affairs in the School of Agriculture and Life Sciences, and ultimately to the Dean of the School of Agriculture and Life Sciences.

Duties: The position involves working with the Associate Dean in the administration and coordination of undergraduate and graduate programs in the School of Agriculture and Life Sciences. The individual selected for this position will have primary responsibility for: new and transfer student recruitment; admission and orientation activities which include a required freshman orientation course; coordination of the undergraduate records and academic advisement program in the School; retention activities, including minorities and foreign students and coordination of the development of an alumni organization within the School. In addition, the Assistant Director will assist the Associate Dean in the administration of the scholarship and awards program, the development of outside funding proposals and interaction with student organizations.

Qualifications and Experience: Applicants must have a doctorate degree in an agricultural or life sciences discipline with a minimum of five years experience in teaching and/or research and academic advising. Excellence must be demonstrated in the areas of teaching, advising, communication skills and organizational ability. Previous administrative experience is desirable although not required. It is essential that the individual be enthusiastic and able to effectively communicate and interact with students, alumni, staff, faculty and external audiences such as 4-H, FFA and other pre-college youth. The successful applicant will be able to creatively represent the diversity of educational and career opportunities in agriculture and the life sciences to the needs of both urban and rural students.

APPLICATION INFORMATION

Applications should include a letter of application, curriculum vitae, statement of administrative philosophy and the names of four professional references. Materials will be accepted through _____.
Applications and/or inquiries should be directed to:

North Carolina State University is an affirmative action/equal opportunity employer.

DRAFT

December 4, 1987

Dr. James L. Oblinger
Associate Dean and
Director of Academic Affairs
College of Agriculture and Life Sciences
North Carolina State University
Box 7601
Raleigh, NC 27695-7601

SUBJECT: Assistant Director, Academic Affairs

Dear Dr. Oblinger:

This is in response to your request for comments about the draft of the position announcement for Assistant Director of Academic Affairs in the College of Agriculture and Life Sciences.

I view the position as a very important one concerned with fundamental aspects of Academic Affairs. The title should reflect the level of responsibility associated with the position, and I believe firmly that the description is that of an Assistant Dean. My concern is that the position be perceived appropriately, for the person who accepts the position must establish and maintain credibility with academic departments here and at other institutions. Credibility must also be established with our constituents. In this connection, one of the duties listed is retention of minority students, and I would point out that an Assistant Dean would have greater credibility in the Black community in recruitment and retention activities than an Assistant Director would have.

My second major concern pertains to the need for assistance with the duties listed in the description. The duties are numerous and varied, and several are relatively complex. To be effective, the person who fills the position will need, at minimum and at the outset, an administrative assistant and a secretary.

Another observation about the list of duties is that it would be useful to indicate that the activities might not be performed simultaneously, but over time.

It would be helpful to include a statement or phrase to indicate some flexibility in the list of duties, since a given candidate would, presumably, have greater interest in some items than in others. For example, I would consider the retention activities, administration of the scholarship and awards program, and assistance with formulation and administration of the Academic Affairs budget to be most enjoyable, although the latter does not appear on the list. In my view, among the least desirable duties would be orientation, recruitment, development of an alumni organization, interaction with student organizations, and interaction with certain of the external audiences indicated in the third paragraph.

You may wish to indicate whether this is a full-time position.

As I indicated earlier, the position is important and should afford an individual a variety of interesting administrative experiences.

Best wishes.

Sincerely,

William C. Grant
Professor and Acting Head

ASSOCIATED COLLEGES OF THE MIDWEST
18 SOUTH MICHIGAN AVENUE, CHICAGO, ILLINOIS 60603 • TELEPHONE (312) 263-5000 • CABLE: ACMID

April 3, 1987

Professor Roger Powell
Department of Zoology
Box 7617
North Carolina State University
Raleigh, N.C. 27695-7617

Dear Roger:

This letter will confirm your appointment for 1987 as a consultant for the course Behavioral Ecology of Mammals for the second session of the ACM Wilderness Field Station Program. As you are probably aware, when the enrollment for a course in the program drops below four, we need to consider cancelling it and thus not retaining the consultant on the staff for the session involved. However, at this time I anticipate this course having the minimum level of enrollment. Also, there is always at least a slight possibility that unforeseen contingencies will deter ACM from holding the program in a given summer, but right now we fully expect this summer's sessions to take place.

Your honorarium will be $2,925 (4.5 weeks @ $650), which will cover your work as consultant of a course in the second session, and will be sent to you in one payment. You will be issued a 1099 miscellaneous income form in January, 1988.

The ACM Chicago office will reimburse you for round-trip travel costs between Raleigh and the field station for you and your family. Reimbursement for travel by car is at the rate of $0.18 a mile. Housing is provided at the station, and there is no charge to staff members for food. However, for family members who are not on the staff, there will be a charge of $4.00 per day for persons twelve or more years of age and $3.00 per day for children between the ages of three and twelve.

The dates of the second session are July 21-August 17. Ken Weik will be the director for the second session, and you should be in touch with him about when you should plan to arrive at the station. His phone number at Lake Forest College is 312/234-3100.

If the terms of the appointment as described in this letter are acceptable, please sign and return the enclosed copy to this office.

You contributed enormously to the program last summer, and I look forward to your participation in it again this July.

Sincerely yours,

John Schilb

John Schilb
Vice President

Enclosure: Copy of this letter for signature

cc: Dean, North Carolina State University ✓
Vice President for Business, North Carolina State University
Lucia Johnson, Director of Finance and Administration, ACM

North Carolina State University
School of Agriculture and Life Sciences
School of Humanities and Social Sciences
Department of Sociology and Anthropology

Box 8107
Raleigh, N.C. 27695-8107

(919) 737-3180

September 10, 1987

MEMORANDUM

TO: Colleagues

FROM: Luther B. Otto

RE: Campus Presentation on the North Carolina Rural Economic Development Center

Because of your interest in economic and rural development, I want to invite you to hear Billy Ray Hall, newly appointed Executive Director of the North Carolina Rural Economic Development Center. He will discuss the Center's goals and operations, as well as funding possibilities for research and educational programs.

Mr. Hall's presentation will begin at 3:00 PM, on Wednesday, September 23, in the second floor Ballroom of the University Student Center. Time will be available for questions.

Please mention this to your colleagues who are interested in rural revitalization, economic development, public policies, or North Carolina agriculture. I hope you will be able to attend this timely presentation. If you have any questions or want further information, please contact Tom Hoban, of our department, at 737-2670.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