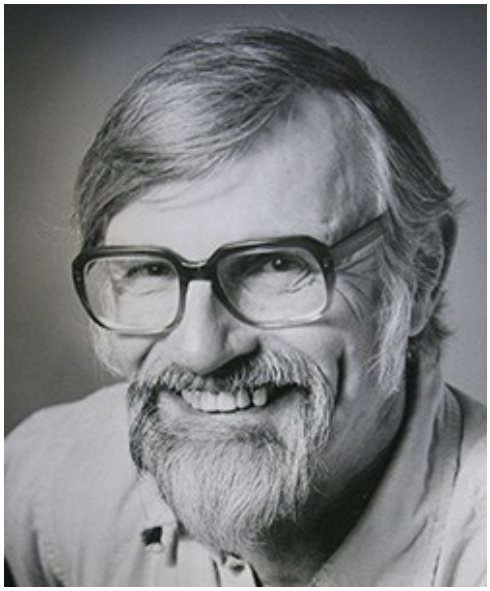
John Hurst, 1930-2016

by Jenifer Wong



John Hurst was a UC Berkeley professor of education and a founder of "Democratic Education at CAL (DeCal—a program of student-led, faculty-sponsored courses).

Joining the faculty of the campus's Graduate School of Education in 1961, Hurst saw education as a means of furthering democratic values and practices. His work aimed to promote social change by empowering people through education.

"John stuck to his values even though his radically democratic approach to education was sometimes not appreciated by colleagues and the administration," said David Stern, campus professor emeritus of education.

When not teaching or researching, Hurst pursued his passion for the great outdoors. He is credited as one of the founders of the Outward Bound movement in the United States, which advocates an approach to learning and personal growth rooted in outdoor expeditions.

"He (spent) as much time as possible outside … (and) taught Outward Bound in Tanzania and Zambia during sabbaticals from UC Berkeley," said his daughter, Jill Hurst. "(He also) rowed dories down the Colorado river several summers for the famous Colorado river guide Martin Litton."

Combining his love for education and nature, John Hurst co-founded the Conservation and Resource Studies Department and developed the environmental education program within the department.

Hurst also co-founded two additional programs on campus: the Peace and Conflict Studies program in 1984 and the undergraduate minor program in the School of Education in 1990, which won the Educational Initiatives Award in 1997. Hurst served as chair of both programs.

Hurst's passion for education inspired students to think critically about the field of education and the issues that impact it. In some cases, he influenced their decision to enter the field.

"He was a very amazing, humble person," said Liliana Aguas, Hurst's former student. "(He) opened (the) door to his home to students … (and) allowed students to have self-determination … (to) not let a grade be a motivation for their learning, but (to be motivated on) their own."

Outside the classroom, Hurst encouraged students to learn about the field of education through community service projects. He served as the faculty sponsor for a campus DeCal that allowed students to mentor middle school students in Berkeley and Oakland.

"I hope he's remembered at Cal for his love of teaching and for helping students learn to take control of their education and world," Jill Hurst said. "He wanted very much to expand (students') understanding of justice and to feel there was something they could and should do to make the world a better place."

Hurst's booklet "Looking Holstically: The Conservation and Resource Studies Major" (1981) is reproduced here.

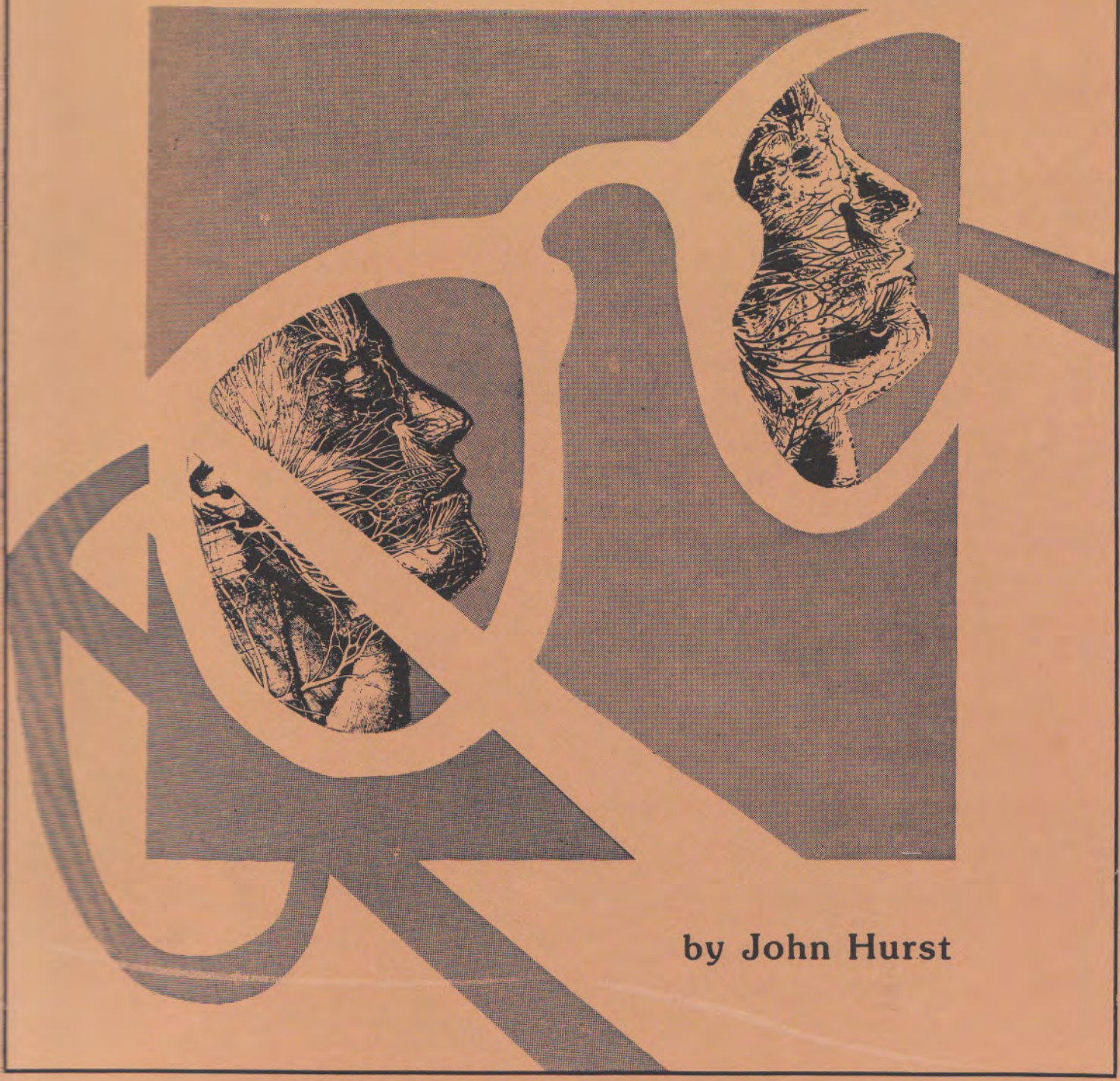
LOOKING HOLISTICALLY

The Conservation of Natural Resources major

The College of Natural Resources

University of California, Berkeley

Its impact on the lives of students and graduates



by John Hurst

LOOKING HOLISTICALLY

The Conservation of Natural Resources major

The College of Natural Resources,
University of California, Berkeley

Its impact on the lives of students and graduates

"During my years in congress, I have always been a supporter of interdisciplinary education as well as an outspoken environmentalist. The Department of Conservation and Resource Studies offers students the opportunity to receive an interdisciplinary education. In addition its course of study is one which is vital to the future of our society."

Ronald Dellums, U.S. Congressman in a letter to Chancellor Heyman, 1981

ACKNOWLEDGMENTS

This study would not be without the time and thoughtfulness contributed by several hundred CNR students and graduates in giving serious attention to completing lengthy questionaires about their educational experiences and the affects they have had on their lives.

Many people associated with CNR have helped in significant ways. In the early phases Pam Michler's work with the Follow-Up Questionaire and data made the rest possible. Throughout the study Linda Banda and Larry Shapiro of the CNR Resource Center have responded to innumerable requests for information and other odds and ends, always in a spirit of collaboration.

At various points in the creation of this report the help of the following persons was critical: Laurie Goodstein, Nancy Skinner, Gail Work, Beth Barker, Ron Thomas-Glass, Jon Simon, Michael Grant, and Susan Steinberg.

The various institutional research centers on campus were generous with their time and data. The Academic Review Unit of The Associated Students of the University of California's reports under the direction of Jeff Koons were critical to the comparative aspects of this study. I am also indebted to Janet Ruyle, assistant director of the Center for Studies in Higher Education, and Austin Frank, director of the Office of Student Affairs Research, for releasing unpublished data from an extensive follow-up survey of U.C. graduates.

Paul Gersper, chairman of the Conservation and Resource Studies Department until December 1980 was very generous in his cooperation and financial support of this project.

Davis Krautner, a CNR graduate, designed the cover of this report.

John Hurst
Berkeley, July 1981

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LOOKING HOLISTICALLY

-THE CONSERVATION OF NATURAL RESOURCES MAJOR-

The College of Natural Resources
University of California, Berkeley

ITS IMPACT ON THE LIVES OF STUDENTS AND GRADUATES

I. Setting the Stage

The Conservation of Natural Resources Major (CNR) embodies a distinct educational philosophy from which a coherent theory and practice has been forged in the rigorous crucible of "praxis". CNR provides a holistic interdisciplinary education focused on the understanding and solution of environmental problems. It strives to achieve meaningful freedom and a broad range of choice for its students within a humane and supportive milieu.

The true worth of an educational program can only ultimately be determined from how it affects those who go through it, and how they in turn affect our larger society. These are the criteria of import.

This study seeks to understand the nature and value of the CNR program through examining its impact on the lives of people while they are in the program and after they graduate. We will also, to a lesser extent, examine the affect of the program, and individuals who have been a part of it, on society at large. A reasonably full explication of CNR's nature and significance can only be achieved by examining it within the parameters of its larger context- The University of California, Berkeley. This will be accomplished through comparing CNR students and graduates with students and graduates from other campus programs.

We will draw on a number of reports and surveys which are listed and annotated in appendix "A". This appendix also includes basic technical considerations covering the data reported throughout this study. Six questionnaire surveys provide the bulk of the quantitative data. They include three surveys that encompass forty

undergraduate programs at Berkeley, including CNR; one follow-up study (1978) of a broad sample of Berkeley undergraduates after graduation (classes of 1971, 1974, and 1977); and two surveys within CNR with extensive narrative data, one a survey of current students (1980-1981), and the other a follow-up study (1980) of CNR students who graduated between 1971 and 1979.

The goal is to fashion the best possible explication of the phenomenon of our concern - the CNR program. In so far as possible the development will incorporate the actual statements of CNR's students and graduates, not simply as illustrative examples, but rather as substantive data. This will serve the important function of keeping the emerging analysis firmly anchored in the reality of peoples' perceptions and understandings of their educations, careers, and lives.

In the following sections of this study we will turn each aspect of the CNR major out from the whole for examination and comparative purposes, with the explicit intent of turning it back into the whole. In this manner we hope to reveal how the interdependence of the many aspects of the program combine synergistically to create the dynamic ecology of CNR. We believe that the program must, of necessity, be evaluated and judged by concepts and methods congruent with its epistemology and conceptual knowledge base - praxis, holistic, ecological, and interdisciplinary. To do otherwise would be to significantly distort the reality we seek to bring to light and understand. We will proceed with a brief description of the CNR major.

THE CNR MAJOR - A DESCRIPTION

The CNR program is the only major in the Conservation and Resource Studies Department (CRS) which is part of the College of Natural Resources. There are currently about 300 students enrolled in the major - 58 percent women, 42 percent men (Sp'81).

A. The Central Elements of the CNR program[1]

1. The central theme of the Major is the identification, understanding, and solution of environmental problems. Environmental issues are examined as they interrelate with societal institutions, natural resources, technology, and cultural values. Emphasis is placed on the development

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1. *The refinement of the description of these elements has continued over the years. Structural modifications and shifting resource allocations have continually occurred to better realize the mandate provided by the key features of the program. Each of these elements was strongly supported in the last Academic Review of the major (The Messenger Report, October 1974) commissioned jointly by the executive committees of the College of Agricultural Sciences and the School of Forestry and Conservation (now combined to make up the College of Natural Resources).*

of critical analytical and practical skills necessary for understanding and solving these problems.

2. The program is interdisciplinary. It draws on all realms of knowledge necessary to understand and resolve complex issues (i.e. Biological Sciences, Social Sciences, Physical Sciences, and the Humanities).

3. Practical experience. The major emphasizes field work, internships, and other forms of community involvement. These experiences are seen as essential to developing an authentic synthesis between theory and practice, to honing analyses, to making informed career choices, and to maximizing the value of a CNR education.

4. Flexibility. Each person has the opportunity and the responsibility, within a supportive structure, to develop their individual focus, within the goals of the major. This is done in close and continuing collaboration with a faculty advisor.

5. Community. CNR strives to create a healthy and viable community; where students, faculty and staff work co-operatively to provide an effective support network in the pursuit of an optimal education.

6. The CNR community aspires to be a functioning participatory democracy. The structure of the Major was created to facilitate the systematic participation of everyone in all decisions, in so far as possible within the limitations set by the University.

B. Curriculum Components

1. CNR Seminar Series (CNR 90, CNR 149). These courses are the major curricular thread that binds the program together.

CNR 90 Introductory Seminar. This course is required of all students entering the program, as an introduction to the CNR community, its philosophy and purpose. Students clarify their educational goals and needs and develop an initial program of study and experiences to meet them. In addition they are introduced to CNR, campus, and community resources that they can draw on in the development of their particular program.

CNR 149 Senior Seminar. The fundamental purpose of this seminar, taken during a student's final quarter, is to assist persons in furthering, or developing, a synthesis of their education, to take a look back, a hard look at the present, and to project into one's future. During this vital time of reflection and closure, each person prepares a written senior synthesis - a focused analysis of their education and its meaning.

2. A broad overview of environmental issues and problems from an interdisciplinary perspective is required. This takes the form of a year long course IDS 10 A, B, and C. Optional project sections, that are strongly recommended, accompany each quarter of the course.

3. Breadth Requirements. In addition to the University-wide breadth requirements (American History and Institutions, and Subject A - basic proficiency in reading and writing), CNR students are required to fulfill the following:

   Reading and composition. Two courses in these areas are required and can be selected from a wide array of choices.

   General knowledge. Three courses are required in four of the following five areas: Biological Sciences, Social Sciences, Physical Sciences, Humanities, and Mathematics/ Statistics. A total of six courses are required in one of the four areas chosen. These courses can be drawn from any on campus that fit an area.

4. Area of Interest. Each person develops a personal focus within CNR known as their "area of interest." Ten upper-division courses must be taken in one's area of interest. These can include any relevant courses, including an internship and independent or group studies courses.

5. Internships CRS 180. Students are encouraged, but not required, to develop a quarter long full-time, or two-thirds time, internship working in a position in the community allied to their area of interest.

6. Field Studies (CNR 197); Supervised Group Studies (CNR 198); and Independent Studies (CNR 199). Students, both collectively and individually, are encouraged to create their own independent studies to further their educational development beyond what is provided by regular courses.

C. Advising

Each student is free to choose his or her own advisor from a book containing extensive descriptions of available faculty from many departments across campus. In CNR, faculty and peer advising play critical roles because of the program's extensive flexibility. This is in contrast to most other majors where students are guided through relatively prescribed programs. CNR has recently developed Area of Interest Groups for furthering common interests, projects and advising. One or more faculty members are usually involved with each group.

D. Structure and Governance

The major is governed by a faculty panel which is drawn from interested faculty in many campus departments, though

the majority are from the College of Natural Resources. A Committee in Charge is elected by the panel to carry on the bulk of its business.

The Administrative Committee is composed of the Committee in Charge and an equal number of students elected by the Student Organization, along with one staff member. The chairperson of the CRS Department is an ex-officio member. This committee, since the inception of the major, has carried the main responsibilities for administering the major. Students are full members of the committee, subject only to University-wide limitations on their voting power in some matters.

Other standing committees are The Advisors' Coordinating Committee and the Course Planning and Development Committee. Each committee is composed of equal numbers of faculty and students and one staff person.

The CNR Student Organization is the official body of the students. This strong and active organization functions as a participatory democracy. It elects all student representatives and assures their accountability. The organization serves as a catalyst and support group in many diverse ways. It generates and facilitates small and large projects within the major, the University and the community. Career forums, lecture series, film series and many other activities that add to the quality of the CNR community flow from its many active participants. The group also publishes a newsletter - The CNR Review.

E. Resources - facilities and people

Central Office. Staffed by the department's administrative assistant and an undergraduate secretary who assists students with the administrative aspects of their programs.

Resource Center. Books, pamphlets, and a host of other resources for classes and projects are collected in a Resource Center that is staffed with a coordinator. The Resource Center is a hub of activity that serves as a communication center for people and projects, as well as for in-depth study.

Staff positions. In addition to the faculty, a senior lecturer teaches many of the core courses and coordinates the internship program. CNR also has two specialist positions that serve important functions in the major.

Resource Center Coordinator. In addition to the many coordinating functions this person serves as a librarian, collecting new resources and helping folks locate a wide range of resources within the Center and elsewhere in the University and greater Bay Area. She coordinates a communications network that serves to bring people and resources together.

Student Opportunities Coordinator. This person, who also works in the Resource Center, carries many important responsibilities: facilitating student searches for project opportunities of all sorts on and off campus; helping students write grants to fund projects; connecting people with part-time and full-time jobs; maintaining the alumni network; performing support work for the student organization; and organizing diverse extra-curricular educational events.

F. Recurring Events

A number of events have become traditional within the major and serve crucial educational and community functions. Most of the organization and conceptualization for these events is done by students in collaboration with staff and faculty.

Weekend Retreats for students, faculty and staff are held at the beginning of the Fall Quarter, and a follow-up day-long retreat is usually held at the start of the Winter Quarter. These well attended events serve as an orientation for new students and more importantly, as a time to assess the major's strengths and weaknesses. These collaborative sessions have generated many improvements in the CNR program and community.

Annual Spring Dinner. This gala celebration is organized and presented each spring by the students and staff who also prepare the feast. It brings together hundreds of students, faculty, staff and alumni for an evening of shared joy, appreciation, and relaxation.

Large Community Gatherings. At least once a quarter, other pressures on the program permitting, the Student Organization or an ad hoc group plan and carry out a large community social event, such as a square dance.

G. Other Program Features

Alumni Network. An active alumni network and association has evolved in CNR. It serves as a support system for alumni and students. Many of our students find field placements, internships, and, not infrequently, permanent positions upon graduation, through links with the alumni network.

The CNR Community. The various features just listed, as well as others not mentioned, combine to create and maintain that elusive and delicate entity - a community, that unique milieu which provides a sense of belonging to a coherent, caring and supportive group of people who are concerned about you as a person, as well as with your education. The CNR community is unique within undergraduate programs at Berkeley. Its qualities of personal belonging, warmth, encouragement, and support create a climate in which growth and learning often exceed expectations. The CNR community's contributions to people's educations and lives can not be underestimated.

The Purpose of Education

Before plunging into a detailed examination of the CNR program and how it compares with other campus programs, we need to pause a moment and reflect on the broad purposes of education, especially within the University. For, in order to develop a comprehensive evaluation of the impact of the CNR program we must have a firm sense of the criteria against which it is to be examined. A rigorous appraisal demands clear and explicit criteria against which practice can be critiqued. The immediate criteria at the level of practice must be consistent with the general purposes at the most abstract level.

A few select quotations about the overall purposes of education will serve to set this section in its largest relevant context:

> *"There is only one subject-matter for education, and that is life in all of its manifestations."*
>
> Alfred North Whitehead
> The Aims of Education

> *"...Our fundamental task in education is to grapple with the issue of a person's overall relationship to reality (intentionality) and to meet them authentically in that reality if we are to contribute to a change in their relationship to reality in specified directions."*
>
> Rollo May
> Love and Will

> *"What professional men should carry away with them from a University is not professional knowledge, but that which should direct the use of their professional knowledge, and bring the light of general culture to illuminate the technicalities of a special pursuit... to look at every separate part of it [knowledge] in its relation to the other parts, and to the whole... observing how all knowledge is connected."*
>
> John Stuart Mill

> *"The advancement of learning at the expense of man, is the most pernicious thing in the world."*
>
> Friedrich Nietzche

The major purposes of the University of California, within this broader context, culled from statements in many official documents, can be captured in the statement: To understand ourselves others and nature; and to further the ideals of our democratic society.

The major goals of CNR, within the larger purposes of the University, are the identification, understanding and solution of environmental problems through a program of interdisciplinary study and experience.

From these general statements a more specific set of goals, that can be infused with the meaning and spirit of the more abstract purposes, can be described. These goals are applicable, with some interpretation and reservations, to any undergraduate program at Berkeley.

Basic educational goals

1. Gaining a thorough understanding of the subject matter.
2. Providing training in critical thinking and analysis.
3. Providing a broad, general, humanistic or person-centered education.
4. Promoting social responsibility and developing skills useful in the community.

Advanced education and career goals

5. Preparation for graduate or professional school.
6. Preparation for a career.

II. The Explication of the CNR Major

The picture of CNR which will emerge in this study must be evaluated against these purposes and goals. Therefore, the material that follows seeks to assess how well the CNR major achieves its goals, how well the major achieves the purposes of the University, and how well the individual goals of students are met in this process. These assessments will be derived from examining the impact of CNR on people's lives both while in the program and after graduation.

Part I. The Broad Picture

1. Overall satisfaction

We will begin by examining persons' general feelings about their education in CNR, recognizing that these not only reflect a synthesis of their attitudes toward all aspects of the program, but also the state of mind with which they move through the program. The degree of satisfaction of CNR students will be compared to that of students in other programs on campus in order to enhance the significance of our findings.

Undergraduates were asked the following question in a number of surveys (all of the ARU-ASUC surveys, and the CNR 1980-1981 survey): (1) All in all, how satisfied have you been to date with your major program (faculty, teaching, advising, courses/curriculum, testing-grading, governance, etc.)? In the CNR Follow-Up Study (1980) the following question was assessed: All in all, from your present perspective, how satisfied are you now with the education you received in the CNR program? In this case the entire questionnaire was reviewed by two independent raters and each respondent was assigned one of the response categories from very satisfied to very dissatisfied. In the 1978 Survey of a representative sample of all U.C. graduates respondents were asked a question that tends to elicit more positive responses than question (1) above: (2) All in all, how satisfied were you with your total undergraduate experience at Berkeley?[2]

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2. *For example when these two questions;* (1) All in all, how satisfied have you been to date with your major program...? *and* (2) All in all, how satisfied have you been to date with your total experience while at Berkeley?; *were both asked in the ARU-ASUC ('79) Survey of Social Science-Related Programs at Berkeley; the respective means on a five point scale were: (1) 3.71 (19% dissatisfied; 11% neutral or mixed; and 69% satisfied) and (2) 3.93 (14% dissatisfied; 12% neutral or mixed; and 74% satisfied). For CNR (1980-1981 Survey) on question (1) 4.31 (2% dissatisfied; 11% neutral or mixed; and 87% satisfied).*

Two factors appear to be operating to precipitate more positive responses to question (1) than to question (2); 1) the question that the representative sample of UC graduates *was asked encompasses the total undergraduate experience at Berkeley. A large number of respondents interpret this to mean both on and off campus experiences*

Overall satisfaction: Means (5 point scale) CNR & comparison groups*

-while students-

CNR-ARU 1979.....4.30

CNR 1980-1981.....4.31/4.55**
87% satisfied; 11% in-between; 2% dissatisfied

Life Sciences-ARU (18).....3.47

All Programs-ARU (40).....3.47
69% satisfied; 11% in-between; 19% dissatisfied

Range-ARU (40).....2.57 - 4.59

Rank CNR-ARU (40).....4th

-after graduation-

CNR Follow-Up 1980.....4.47
90% satisfied; 5% in-between; 5% dissatisfied

Grad Survey 1978.....4.02
78% satisfied; 9% in-between; 13% dissatisfied (see footnote #2)

* For this and all following tables unless otherwise indicated: A *full description of each study can be found in Appendix "A".* CNR-ARU '79 = *ASUC's Academic Review Unit's data on CNR from the survey of* Social Science Related Programs at Berkeley - 1979; CNR - 1980-1981 = *the* 1980-1981 Questionnaire Study of CNR Undergraduates; Life Sciences-ARU (18) = *ASUC's survey of 18* Life Science Related Departments and Programs at Berkeley - 1978; All Programs-ARU (40) = *mean for all programs surveyed by the Academic Review Unit of the ASUC;* Range-ARU (40) = *mean of the lowest and highest program in the 40 programs surveyed by ARU-ASUC;* Rank CNR-ARU (40) = *indicates the rank of CNR mean in the 40 programs surveyed by the ARU-ASUC;* CNR Follow-Up 1980 = *the 1980* Follow-Up Interview and Questionnaire Study of CNR Graduates; Grad Survey 1978 = *the follow-up study of a broad sample of* all UC graduates from undergraduate programs. *Responses unless otherwise indicated were made on a 5 point scale from: 1-very low, through 3-in-between, to 5-very high (wording varies from question to question so responses will make sense [e.g. on Overall satisfaction question: 1-very dissatisfied, to 3-in-between, to 5-very satisfied]).* 95% Confidence Intervals *(the range within which the true mean for the whole group under consideration could be expected to fall 95% of the time): the figures we will cite are the values, they vary around from question to question throughout this report: CNR-ARU ±.30; CNR 80-81 ±.10; CNR Follow-Up ±.10; Life Sciences ±.15; All Programs-ARU ±.10; Grad Survey 1978 ±.10.*

**Mean *for sub-sample of 1980-1981 Survey who had been in CNR program for four or more quarters.*

2. (continued)
while living in Berkeley. While the question asked CNR graduates *and* undergraduates *specifically focuses on their experiences in the CNR program; 2) in the comparison between* CNR graduates *and* UC graduates *an additional factor is operating.* CNR graduates *were specifically assessed on their satisfaction at the time they filled out*

Discussion of Overall Satisfaction. CNR students are on the whole quite satisfied with their education in the CNR program. This high level of satisfaction was consistent across the two studies of CNR undergraduates (one conducted in 1978 and the other during 1980-1981). Comparatively, CNR ranked among the top few programs of the forty surveyed (4th).[3]

CNR graduates from the vantage point of their present experience and knowledge continue to be highly satisfied with the education they received through CNR. Compared to U.C. graduates in general, CNR graduates continue to maintain the same high relative position that they did as undergraduates.

It can be concluded that CNR students are more satisfied with their education in CNR than students in all but a very few programs on campus, and that this high absolute and relative level of satisfaction continues to hold up after graduation in the face of the rigors of advanced education, careers and life.

The strong relationship between satisfaction while in college and later satisfaction after graduation is consistent with the general data in the literature from many studies. These findings underline the importance of taking students' satisfaction into account in both the development and evaluation of educational programs. It clearly has immediate and long range implications for the quality and value of education. The many sources of this high and persistent level of satisfaction will be revealed and examined as the sections of this study unfold.

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2. (continued)
the questionnaire, from the perspective of their experiences since graduating; while UC graduates *were asked a more ambiguous question (e.g. "...how satisfied were you...") which is usually interpreted to mean at the time of graduation by respondents. Given these two factors, the fact that* CNR graduates *have a significantly higher mean than* UC graduates *takes on added significance. It is probably an underestimate of the true difference between the two groups.*

We would also like to note how closely undergraduate results parallel results from graduates when they are drawn from the same population *(e.g. on question (1) CNR 1980-1981 Mean = 4.31 [4.55 for students who had been in CNR four or more quarters which would be a more appropriate comparison]; CNR Follow-Up Mean 4.47 on question (2) U.C. undergraduates Mean = 3.93; U.C. graduates Mean = 4.02). This tends to hold whenever such comparisons are possible in the data reported in this study.*

3. *In the ARU surveys four programs consistently ranked high on virtually all questions, with few significant differences between them (.05 level of confidence). For example, on Overall Satisfaction (means): CNR-4.30; Geography-4.59; Developmental Studies-4.47; Social Science Field Major-4.33. Other relatively high ranking programs were: History-3.90 and Nutrition-3.81. It is significant to note that the other high ranking programs tend to be relatively small compared to CNR. Office of Admissions and Records enrollment figures, which are underestimates, at the time of the studies were: CNR-200; Geography-91; Developmental Studies-49; and Social Science Field Major-132.*

2. Permanent Value

Students in this question were asked to project whether or not they believed their course of study would have permanent value for them. CNR graduates were asked if, in fact, their course of study was of value to them now.

Undergraduates in the ARU-ASUC survey of Social Science Related Programs (1979), and graduates in the CNR Follow-Up Study (1980) were asked: Study of this subject matter [My study in CNR] will be [has been] of permanent value in my life and/or work.

Permanent Value: Means (5 point scale) CNR and comparison groups

CNR-ARU 1979.....4.58

All Social Sciences (14).....4.09
*(5) SA-43%; (4)A-36%; (3)IB-12%; (2)D-6%; (1)SD-3%

Range ARU-Soc.Sci. (14).....3.64 - 4.67

Rank CNR (ARU-Soc. Sci.[14]).....3rd

CNR Follow-Up 1980.....4.59
(5)SA-67%; (4)A-27%; (3)IB-5%; (2)D-0.5%; (1)SD-0.5%

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*(5) Strongly Agree; (4) Agree; (3) In-between; (2) Disagree; (1) Strongly Disagree

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Discussion of permanent value. Well over ninety percent (90%) of the CNR students believed their program would have permanent value in their lives or work or both, compared with the average of seventy-nine percent (79%) for all programs surveyed. CNR once again ranked among the top few programs of those surveyed (3rd).

Ninety-four percent (94%) of CNR graduates report that their course of studies has been of permanent value in their lives or work or both.

Students' projections of permanent value were almost identical to graduates' later assessments of value. This parallels the findings with respect to "overall satisfaction."

In summary, CNR students believe that their course of studies will be of substantial permanent value, and graduates confirm that this is, in fact, the case.

3. Understanding Environmental Problems

A third important question we can ask is; do students believe they are developing, and do graduates believe they have developed, an understanding of environmental problems?

CNR students responding to the 1980-1981 questionnaire were asked: CNR encourages broad interdisciplinary environmental studies. Do you feel you are developing your ability to identify, understand and seek solutions to environmental problems in a broad context?

CNR graduates responding to the Follow-Up Study were asked: CNR encourages broad interdisciplinary studies. Do you feel you developed an understanding of environmental problems (social, economic, and political aspects, as well as a scientific/technical grasp)?

Understanding Environmental Problems: Means and Percentages

CNR 1980-1981.....4.32/4.47*
(5) Yes, very much so-49%; (4)36%; (3)14%; (2)1%; (1)No, hardly at all-0%
*(5)Yes, very much so-61%; (4)28%; (3)9%; (2)2%; (1)No, hardly at all-0%

CNR Follow-Up 1980.....4.57**
(3)Yes, very much so-75%; (2)Substantially-24%; (1)No, hardly at all-1%

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*sub-sample of students who have been in CNR four or more quarters

**Mean adjusted to a five point scale for comparative purposes

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Discussion of Understanding Environmental Problems. CNR students judge themselves to be in the process of gaining a solid background in the ability to identify, understand and seek solutions to environmental problems. The responses of students who have been in the program four or more quarters demonstrates the progressive nature of this process one would expect the data to reveal.

CNR graduates indicate that they have, in fact, developed an excellent knowledge and skill base in this area. This suggests that CNR students' judgements of their development along these lines is accurate, and not simply an ill-founded belief. Further corroboration can be found in the findings that the understanding and solution of environmental problems is an important part of the work or advanced studies of ninety-one percent of CNR graduates; and that it plays an active role in the work or lives or both of ninety-eight percent (98%) of CNR graduates.

4. Selected Educational Goals. The importance people place on them and the extent to which people judge their program has met them.

Four important questions can be raised at this point in our progress:

1. How much do students value selected educational goals?
2. How well do students' educational goals reflect the goals of their program?
3. How well does a program meet each of these educational goals in students' judgements?
4. How well, as judged by students, do their programs enable them to meet their goal expectations?

Berkeley undergraduates in the forty programs surveyed by the Academic Review Unit of the ASUC were queried as follows:

To what extent are the following goals important to you, and to what extent has your major program met them?

Basic educational goals

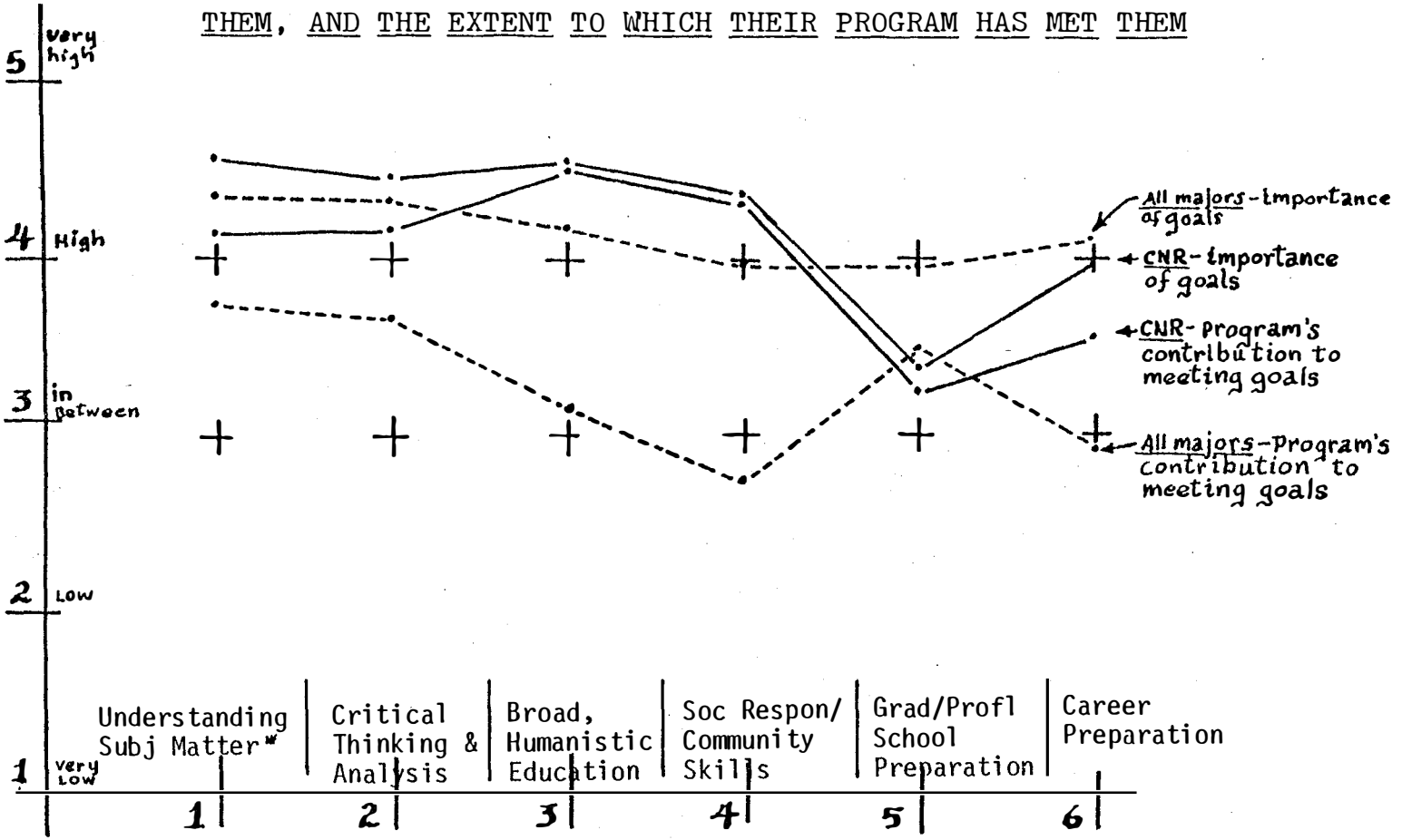
1. Gaining a thorough understanding of the subject matter.
2. Providing training in critical thinking and analysis.
3. Providing a broad, general, humanistic or person-centered education.
4. Promoting social responsibility and developing skills useful in the community.

Advanced education and career goals

5. Preparation for graduate or professional school.
6. Preparation for a career.

Figure A (page 15) plots the importance CNR students, and undergraduates in general, place on each of the six goals; and plots the extent to which CNR students, and undergraduates in general, judge their program has enabled them to meet each of these goals. The distance (differences) between the pair of plotted lines for CNR students (solid lines), and pair of plotted lines for undergraduates in general (dotted lines), can be taken to indicate the difference between students' goal expectations and the degree to which they feel that they are being met. Thus, the differences

Figure A. SELECTED EDUCATIONAL GOALS. THE IMPORTANCE PEOPLE PLACE ON THEM, AND THE EXTENT TO WHICH THEIR PROGRAM HAS MET THEM



- *Means for each goal are plotted on the graph.*

* *Understanding Subject matter - data available only for 14 Social Science Related Programs.*

Table A

IMPORTANCE OF SELECTED EDUCATIONAL GOALS, AND THE EXTENT TO WHICH PROGRAM HAS MET THEM

goal	CNR imp.	R_i	CNR met	R_m	CNR diff.	R_d	SOC. SCI. imp.	SOC. SCI. met	LIFE SCI. imp.	LIFE SCI. met	HUMAN. imp.	HUMAN. met	ALL PROGRAMS(40) imp.	ALL PROGRAMS(40) met	Range -Imp. -met	Mean diff.
1.Understanding Subject Matter(1)	4.6	1	4.1	1	-.46	5	4.4	3.8	-	-	-	-	4.3	3.8	4.1-4.6 3.3-4.1	-.60
2.Critical Thinking & Analysis	4.5	7	4.2	2*	-.32	3*	4.4	3.8	4.3	3.6	4.4	3.6	4.3	3.6	4.1-4.7 3.2-4.4	-.67
3.Broad, Humanistic Education	4.5	3	4.5	2	-.03	2	4.3	3.7	4.0	2.7	4.4	3.3	4.2	3.2	3.6-4.7 2.0-4.7	-.98
4.Social Respons./ Community Skills	4.3	4*	4.3	1	-.03	1	4.1	3.2	3.9	2.6	3.8	2.2	4.0	2.8	3.3-4.6 1.8-4.3	-1.23
1-4. AVERAGE	4.5	1*	4.3	1	-.21	1	4.3	3.6	4.1	3.0	4.2	3.0	4.2	3.3	---	-.87
5.Grad/Professional School Prep.	3.4	39	3.2	34	-.17	8*	3.8	3.4	4.2	3.6	3.7	3.2	3.9	3.5	3.4-4.5 2.9-4.1	-.47
6.Career Preparation	4.0	24	3.5	4	-.43	3*	4.1	3.1	4.2	3.1	3.8	2.4	4.1	3.0	2.9-4.7 2.0-4.1	-1.15

(1) *Data on* Understanding Subject Matter *available only for 14 Social Science related programs.*
Key: imp = *importance of goal to students;* met = *extent to which program has met goal;* R_i = *rank of CNR among all programs on importance of goal;* R_m = *rank of CNR among all programs on extent to which program has met goal;* R_d = *rank CNR among all programs in terms of the amount of difference between importance of goal and the extent to which program has met the goal;* diff = *difference between importance of goal and the extent to which program has met the goal;* Range = *the lowest and highest program mean for* imp *and* met; Scale = *five points from 1-very low to 5-very high, all scale scores reported in means;* Programs = *40 programs from Social Sciences and related (14), Life Sciences (18), and Humanities (8).* 1-4 Average = *means for four liberal arts goals combined and rank of CNR among all programs for combined means.* * = *indicates ties in rank (within ±.01 difference).*

between CNR students' goal expectations and the degree to which they feel they are being met can be easily visually compared with the same data from U.C. undergraduates in general.

Table A (page 16) presents the means and differences for CNR and for each of the ARU-ASUC surveys separately, as well as the overall means and differences for all programs combined. In addition it gives the rank of CNR among all of the programs surveyed for: the importance placed on each goal; the extent to which the program met the goal; and the size of the differences between expectations and the degree to which the program was judged to be enabling students to meet the goals.

Basic educational goals. The CNR program stresses each of the four basic educational goals fairly equally. Few other programs at Berkeley give substantial and equal weight to each of these goals in their program. U.C. students' responses to these questions (see Table A) corroborate the objective statement made above. That is CNR stresses: (1) A broad interdisciplinary background to enable people to identify and understand environmental problems; (2) The essential skills in critical thinking and analysis to achieve one above and to develop effective solutions; (3) Taking social responsibility and developing skills to work in the community to contribute to the actual solution of environmental problems; (4) A humane education that respects each person's dignity and worth.

An examination of the data presented in Figure A and Table A yields the following results:

Basic Educational Goals

CNR students, as a whole, see each of these goals as having high absolute importance for them (a mean of 4.5 on a five point scale). In addition CNR students ranked first among the forty programs surveyed in terms of the overall importance of these goals to their educational experience (average across the four goals).

CNR students, as a whole, judge the extent to which CNR has enabled them to meet each of these goals as very high in an absolute sense (mean of 4.3 on a five point scale). In addition CNR students again ranked first among the forty programs surveyed in terms of their judgement of the extent to which their program enabled them to meet these four goals (average across means for 'extent met' of four goals).

CNR students, as a whole, have been able to meet their educational goal expectations in these areas very well in CNR (i.e. the differences between 'importance of goals' to CNR students, and the extent to which they judge the CNR program is enabling them to meet them are very small absolutely and relatively). Additionally CNR once again ranked first among the forty programs surveyed having the smallest average discrepancy between goal expectations

and the extent to which their program met each goal (average across discrepancy for each goal).

In summary, CNR stands out as the number one program in terms of the absolute importance placed on these basic educational goals by its students; in terms of the absolute extent to which they judge the CNR program is enabling them to meet these educational goals; and in terms of the CNR program's ability to enable them to meet their own expectations for each of these goals. Thus, it can be concluded that the goals stressed and realized within the CNR program are more congruent with the importance of these goals to students in CNR than for any other program surveyed (taking probable errors into account, at least among the top couple programs).

Advanced Education and Career Goals

The CNR program is, in essence, a broad interdisciplinary education focused on the environment. Within this general framework students are free to choose their own directions with guidance and support from the CNR community. This is explicit in the last Academic Review of CNR that serves as the program's current mandate. It states, "It should be made clear that the major provides a generalists' background to conservation, but that it is not designed to prepare students for specialized resource management positions (Messenger Report-1974, page 1)." A more precise and operational reading is that CNR does not 'automatically' prepare students for either specialized careers, or for advanced education in either graduate or professional schools. However, students are free to choose to do either, or to simply gain a broad general education with a focus on the environment. Rather than giving students direction, CNR attempts to provide a milieu which enables students to systematically determine and refine their own directions within the broad framework of the CNR program. This is a relatively unique stance for programs at Berkeley and must be understood in order to interpret the data about advanced education and career goals.

Preparation for Graduate or Professional Schools

CNR students, as a whole, rated the importance of this goal roughly in the middle of the scale (mean of 3.4 on a five point scale). This merely reflects an objective fact. That is, about half of CNR's students intend to seek advanced education at some point in the near future after graduation and prepare themselves for this eventuality; while the other half of CNR's students have neither the desire nor the intent of going on for advanced education in the forseeable future, and prepare themselves in many diverse ways for their lives after graduation. The University is obligated, both because of the reality of what its undergraduates do after graduation, and by its charge from the state of California, to serve both groups - those who continue their education, and those who enter the job market after graduation. CNR ranked near the bottom (39th out of 40) in terms of the importance students placed on 'preparation for graduate

or professional school'. In short, persons who rated this goal high were cancelled out by those who rated it low. Both groups were responding appropriately given their very legitimate educational goals within CNR. A considerable body of evidence, which we will review in this study, suggests that CNR students have a much clearer idea of where they want to go with their education at U.C. than students in general across the campus. For example, CNR students were in the upper quartile (ranked 8th) of the programs surveyed on the degree of discrepancy (high end of scale equals the smallest discrepancy) between goal expectations and the extent to which the program was meeting their expectations. This relationship can be clarified by citing another program that has a similar pattern. Business Administration students ranked near the bottom in the importance they placed on the goal of advanced education (38th), and ranked at the top in terms of the smallness of the discrepancy between expectations and the extent to which the goal was being met (1st). In a fashion similar to CNR students, undergraduates in Business Administration have a relatively clear idea about whether or not they want to start a career, usually in business, immediately after graduation, or continue on for advanced education. They too are split evenly between these two reasonable and legitimate choices.

Fourty-five percent (52% of the women, and 40% of the men) of CNR's graduates from the classes of 1971 through 1979 have gone on for advanced education. This figure is comparable to other undergraduate professional school programs with similar career dynamics. Fifty-eight percent (55% of the women, and 62% of the men) of all U.C. graduates during approximately the same time period (classes of 1971, 1974, and 1977) went on to advanced education. CNR women appear to have overcome much, if not all, of the discriminatory aspects of advanced education that affect most U.C. women graduates. Eventually larger percentages of both CNR and U.C. graduates will earn advanced degrees or credentials due to the time lag that frequently occurs between receiving the baccalaureate and entering advanced education programs. Detailed data and discussion will be found in Part VIII "The Advanced Education, Careers, and Lives of CNR graduates."

Preparation for a Career

Again we find CNR students placing relatively low importance on this goal (ranked 24th), but reasonably high importance in an absolute sense (mean of 4 or 'high', on a five point scale). One of the intriguing findings that emerges is that though CNR students place relatively low importance on 'career preparation' as a goal, they rate CNR high relative to other programs on the extent to which it is meeting this goal (ranked 4th). The discrepancy between 'goal expectation' and 'extent program is meeting' is also relatively low for CNR (ranked 3rd). This is particularly noteworthy when we realize that the discrepancy for CNR students is -.43 compared to an average discrepancy for all programs of -1.15 between the 'importance of career preparation' and the 'extent to which program is meeting this goal'.

We can conclude that those students who seek to prepare themselves for careers in CNR judge CNR to be effective in helping them to this end. Later data in this study will serve to further validate this conclusion.

General discussion of data on basic educational goals and advanced education and career goals. People in nearly all undergraduate programs place high and essentially equal importance on all of the basic educational goals (e.g. range of means 4.0 - 4.3). In virtually every instance students' programs fall short on the extent to which their goal expectations are being met (e.g. range of means for 'extent met' 2.8 - 3.8). The largest discrepancies are found in 'promoting social responsibility and developing skills useful in the community', and in 'providing a broad, general, humanistic education' (i.e. average discrepancies of -.98 and -1.15 respectively). In contrast CNR students not only rate all of the basic educational goals as very important (e.g. 1st among all programs), they judge the degree to which CNR has helped them meet these goals nearly equally as high (e.g. 1st among all programs). This is especially true, relative to most other programs, for 'social responsibility and community skills' and a broad humanistic education'. In summary, CNR has more fully and evenly satisfied, as judged by its students, the four most typically mentioned 'liberal arts' educational goals, than any other of the forty campus programs surveyed.

Programs like CNR, with its flexibility and freedom of choice, are often criticized, usually without systematic evidence, as being too loose and not rigorous enough. The evidence from this set of questions, and much of the data in the rest of this study, strongly suggests the opposite conclusion. That is, CNR students highly value basic educational goals, and they judge the CNR program as enabling them to meet their goal expectations to an uncommonly high degree. That an occasional student, or students, may misuse this flexibility and freedom, and that these acts may at times be highly visable, in no way invalidates the conclusion drawn from the work of the overwhelming majority of the students in the program. Conversely, many students take advantage of traditional programs through various forms of cheating (e.g. cheating on exams, borrowing or purchasing term papers from others, etc.) which all evidence [4] indicates is extensive, widespread, and once more on the increase. These acts are usually not detected and are hence ignored. All available evidence from which to draw inferences suggests that the amount of cheating in programs like CNR, where students tend to be trusted, respected and encouraged to learn cooperatively, as well as allowed to fashion their own personally meaningful educations, is substantially less than in traditional programs.

Considering the two questions on advanced education and career goals leads to some interesting observations. Undergraduates, in

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4. *For background see William Brower's well publicized 1964 report on "academic dishonesty" in which at least half of his sample had engaged in one form or another of "academic dishonesty." For up-date see Chronicle of Higher Education, February 16, 1981, and series of articles in The Daily Californian, November 24, 25, 26, 1980.*

general, tend to rate the importance of these two goals equally high (e.g. means of 3.9 and 4.1 respectively); and the extent to which they are met relatively low, especially career preparation (e.g. means of 3.5 and 3.0 respectively). The discrepancies between 'importance' and 'met' were -.47 and -1.15 respectively. Thus, U.C. Berkeley, in terms of students' judgements, is doing a relatively good job of meeting students' expectations concerning preparations for advanced education (e.g. the lowest discrepancy among the six goals); but a relatively poor job of meeting students' expectations for career preparation (e.g. the second largest discrepancy). In contrast, the CNR program seems to meet its students' expectations in these areas reasonably well (e.g. discrepancy for advanced education was -.17 [ranked 8th], and for career preparation it was -.43 [ranked 3rd]). See Table A. The fact that only fifty-eight percent (58%) of U.C. graduates from the classes of 1971, 1974, and 1977 were either attending or had graduated from graduate and professional schools in 1978 (the figures for CNR for a comparable period are forty-five percent (45%)), indicates the wisdom of students rating the importance of these goals equally high. That is nearly half of U.C. graduates (perhaps as low as 35-40% in the long run) never go on to graduate or professional school. The University, as we have already suggested, has a responsibility to meet the needs of these persons, too. CNR appears to do this better than most programs, while at the same time meeting the needs of those students who choose to prepare themselves for advanced education (e.g. 5% of CNR graduates are in or have graduated from medical school with special interests in environmental health; 5% are in law school or have become lawyers with special interests in environmental law; and 28% are in or have graduated from Master's degree or PhD programs in many diverse fields).

In summary, CNR students see these basic educational goals as being very important to them, and judge CNR to be effective in enabling them to meet their educational goal expectations in these areas - more so than any other campus program surveyed. Additionally CNR students appear to have made relatively realistic choices about advanced education and career goals, and CNR has helped them meet these expectations fairly well, especially in comparison to other campus programs. The sections of this study which follow will further explicate these findings.

5. After Graduation

A brief overview of available data will round out the broad picture offered in this part of the study before embarking on a more detailed and in-depth examination of the CNR program and its impact. The data that follows will be presented and discussed more fully, as appropriate, in subsequent sections.

The later application of undergraduate education

1. CNR graduates. Ninety-six percent (96%) of CNR graduates reported that the broad understanding and solution of

environmental problems played an active role in their present lives.

2. CNR graduates. Ninety-one percent (91%) of CNR graduates reported that the broad understanding and solution of environmental problems was important in their work and/or advanced educational programs.

3. CNR/UC graduates. [U.C. graduates = a representative sample of all U.C. graduates from Bachelor's Degree programs].

   Did you acquire knowledge or skills as an undergraduate at CAL which are of value in your work/studies now?

   A. CNR graduates (Follow-Up Study 1980).....Yes - 96%

   B. U.C. graduates (Grad Survey 1978).....Yes - 75%

Advanced education in graduate or professional schools

4. Enrolled in or completed degree or credential programs in graduate or professional schools.

   A. CNR graduates (Follow-Up Study 1980).....45%

      52% of the women, and 40% of the men

   B. U.C. graduates (Grad Survey 1978).....58%

      55% of the women, and 62% of the men

Satisfaction with career or developing career

5. CNR graduates. Are you satisfied with your current or developing career/work?

   CNR Follow-Up Study 1980.....mean = 4.25*

   Women..... mean = 4.24*
   (5)ES-51%; (4)S-30%; (3)IB-12%; (2)D-5%; (1)VD-2%

   Men..... mean = 4.26*
   (5)ES-45%; (4)S-40%; (3)IB-11%; (2)D-4%; (1)VD-0%

6. U.C. graduates (Grad Survey 1978). Overall, how satisfied are you with your:

   A. job working conditions? .....mean = 3.60**

   Women..... mean = 3.55**
   (5)VS-22%; (4)S-34%; (3)IB-27%; (2)D-10%; (1)VD-7%

   Men..... mean = 3.73**
   (5)VS-28%; (4)S-37%; (3)IB-22%; (2)D-8%; (1)VD-5%

B. future job prospects?.....mean = 3.71**

Women..... mean = 3.47**
(5)VS-24%; (4)S-29%; (3)IB-27%; (2)D-12%; (1)VD-8%

Men..... mean = 3.87**
(5)VS-34%; (4)S-36%; (3)IB-19%; (2)D-7%; (1)VD-4%

*ES=extremely satisfied, all others same as U.C. graduates
**VS=very satisfied; S=satisfied; IB=in between;
D=dissatisfied; VD=very dissatisfied

College reconsidered

7. CNR/U.C. graduates. If you were considering college today with the advantage of your present experience and knowledge would you:

A. do it all the same?

CNR Follow-Up Study 1980.....70-85%*

Grad Survey 1978.....20%

B. take more courses in another area or areas?

CNR Follow-Up Study 1980.....10-20%*

Grad Survey 1978.....47%

C. change major?

CNR Follow-Up Study 1980.....5-10%*

Grad Survey 1978.....30%

*These questions were not asked, as such, in the CNR Follow-Up Study 1980, but were mentioned or alluded to in the narrative responses on most questionnaires. The judgements given above (probable lower and upper estimates) were made by reviewing the questionnaires and categorizing each one on these questions. These figures should still be interpreted with some caution, though the general range is believed to be quite accurate and is in keeping with the other available data (e.g. overall satisfaction, etc.).

Overall satisfaction with undergraduate program/undergraduate experience (presented again for ease of comparison).

8. CNR/U.C. graduates.

   CNR Follow-Up Study 1980: All in all, from your present perspective, how satisfied are you now with the education you received in the CNR program?

   Mean = 4.47
   *(5)VS-61%; (4)S-29%; (3)IB-5%; (2)D-4%; (1)VD-1%

   Grad Survey 1978: All in all, how satisfied were you with your total undergraduate experience at Berkeley?**

   Mean = 4.02 (adjusted to a five point scale)
   *(7)VS-31%; (6)S-33%; (5)SS-14%; (4)N-9%; (3)SD-7%; (2)D-3%; (1)VD-3%

*VS=very satisfied; S=satisfied; SS=somewhat satisfied; IB=in between; N=neutral or mixed feelings; SD=somewhat dissatisfied; D=dissatisfied; VD=very dissatisfied.

**We have already indicated that the question asked U.C. graduates tends, on the whole, to elicit more positive responses than the one asked CNR graduates (see Footnote #2, page 9).

Discussion of after graduation. On every available index of long term satisfaction and value in careers and life, CNR graduates stand out with both absolutely and relatively high indices. For example, ninety percent (90%) of CNR graduates are satisfied with the education they received in CNR from their current perspectives; in comparison, seventy-eight percent (78%) of U.C. graduates in general indicate that they were satisfied on a similar question that yields more positive responses than the one CNR graduates were assessed on. Ninety-six percent (96%) of CNR's graduates reported that the central purpose of CNR's program - the identification, understanding, and solution of environmental problems - played an active role in their present lives. Similarly, ninety-six percent (96%) of all CNR's graduates said they had acquired knowledge and skills as undergraduates in CNR that are of value in their present work; while in comparison, seventy-five percent (75%) of U.C. graduates in general answered "yes" to the same question. Approximately eighty percent (80%) of CNR's graduates indicated that if they had their undergraduate education to do over again they would do it essentially the same way; while only about fifty percent (50%) of U.C. graduates in general indicated they would do it essentially the same if they had it to do over again.

Fourty-five percent (52% of the women; 40% of the men) of CNR's graduates went on to advanced education; compared to fifty-eight percent (55% of the women; 62% of the men) of all U.C. graduates. CNR women graduates have achieved at least equity with CNR men in going on to advanced education at a greater rate than CNR men in, principally, traditional male fields.

Eighty-three percent (81% of the women; 85% of the men) of CNR's graduates are satisfied with their current or developing careers; compared to between sixty-one and sixty-three percent (53%-56% of the women; 65%-70% of the men) of all U.C. graduates responding to similar, but not identical, questions. CNR women enter traditional male professions at the same rate as CNR men. CNR women are nearly as satisfied as CNR men, and substantially more satisfied than U.C. women, who are significantly less satisfied than U.C. men.

CNR women in all indices after graduation have more nearly achieved equity with men in advanced education, careers, and satisfaction in current or developing careers, than U.C. women in general. This is particularly impressive because CNR women and men graduates tend to enter fields that have been traditionally male dominated. This data will be developed and discussed in detail in Part VIII-The Advanced Education, Careers, and Lives of CNR Graduates."

In summary, CNR graduates' education has served them very well in careers and life. Their education, in comparison, has been substantially more effective than that of U.C. graduates in general. Especially significant is the fact that CNR women, unique for campus programs, have achieved equity with CNR men after graduation in traditionally male fields. All of these findings will be explored in more detail in later sections of this report.

In Conclusion

We have presented a broad picture of the nature and impact of the CNR program on the educations, careers, and lives of its participants both while they are in the program and after they graduate. The nature and sources of the effectiveness of the CNR program will be explicated in each of the subsequent sections of this study.

Before passing on to a more detailed examination of CNR, a few statements from its students and graduates will infuse life into what has been developed thus far:

Statements from undergraduates

"...the CNR program has encouraged us to be 'spontaneous, independent, yet related to each other...,' to grow personally, and to choose a 'life of action'. To the CNR student who might ask 'What job can I do?' the question is returned, 'What purposeful activity do you see happening around you that you would like to get involved in?'...[she goes on to reflect her perception of the attitude of the faculty and staff using their own voice] 'I want to try to find an atmosphere where they [CNR students] can learn. I would like them to be able to recognize their own worth.'"

"CNR's integrated approach to education is indeed the ultimate in educational process. This approach, if properly followed, allows the student to understand, analyze, and develop remedies to our current problems."

"I doubt very much if I could be in any other program at CAL, particularly as an undergraduate 25 years old with several years of work and life experiences. In fact...I'm positive!"

"CNR as an alternative to the mainstream course of study at CAL takes on added importance as a refuge for those of us who function as square pegs in the round holes of University education."

"CNR has provided a creative outlet in this University, and has helped me feel much less alienated."

"In a world of problems, CNR is committed to social change and the furtherance of life on Earth - What more can I say?"

With respect to CNR's emphasis on practice: "Hands-on experience with the many structures of problem solving in Berkeley politics and in CNR itself aids the more academic abilities of course work."

"Without a doubt this program has fulfilled my needs from when I was first accidentally thrown in the college as a transfer. It has given my life a direction and at the same time has given me something I want to be more educated about."

Statements from graduates

From a man who graduated in 1974 and is a freelance naturalist and educational consultant: "It [my CNR experience] was one of the most exciting events in my life. I am still not through with it, the network extends to myriads of people who are educators, artists and environmentalists. The process continues..."

From a woman who is a physician in family practice ('73): "I wanted a broad community based understanding of the environmental, social and political aspects of American life to form a basis on which to train in medicine and place my work in proper focus...CNR was the only major on campus that allowed me to design such a major in conjunction with the more technical courses

necessary for pre-med...

In summary, my enthusiasm for CNR is based on the opportunity provided me to:

1) *develop my own program - which was rich and useful to this day.*
2) *develop a broad perspective on health to set my technical training into a useful framework.*
3) *a supportive environment that allowed me to continue to optimistically pursue an education relevant to me."*

From a man ('79) working for a Ph.D. in Sanitary Engineering at U.C. Berkeley, who is also a research assistant at Lawrence Berkeley Laboratory: *"CNR is a very important component of the University. The major allows people that are searching for different ideas and lifestyles to become educated and trained. Many students who are not "dumb" but just don't want Biology Plan C can challenge their creativity, and explore alternatives that will aid themselves, society, and the world. In all natural systems the option of change and/or reappraisal and creativity is essential to the survival of a group."*

From a woman who is the director of a Learning Development program at an Oregon Community College and currently on leave while undertaking an advanced degree in education in Great Britain on full scholarship: *"CNR's holistic philosophy has been a mainstay in my leadership capabilities and all of my endeavors...I'm a far more analytical and synthetic thinker as I pursue advanced interdisciplinary studies."* (a 1974 graduate)

A young disabled woman who graduated from CNR in 1976 has gone on to become one of the world's leading authorities on recreation for the disabled. While she was in CNR she founded Berkeley Outreach Recreation Program (BORP) as an integral part of her educational program. This program (BORP) made natural environments and other individual recreational choices accessible to disabled people for the first time, and has become internationally renowned for its pioneering work. She has continued her studies here and abroad, always with full scholarships won on merit. Of her education in CNR she writes: *"...my framework for focusing on issues reflects my CNR education. I see the problems and potentials of the disabled population as part of larger interrelated issues...*[CNR] *enabled me to understand other complicated issues in my field, by viewing these issues in their social, economic, and political contexts. ...I wondered if my CNR degree would be too vague when competing with traditional recreation majors. Yet when compared with Masters and Ph.D. students from all over the U.S. with traditional degrees, my accomplishments which I achieved as a CNR student, proved to be of more importance to those giving educational grants to recreation students...*[in commenting about the democratic character of CNR] *This confidence in having control of decisions and being an independent thinker allowed me to initiate programs in the community, write proposals, organize alternative types of programs, become a leader instead of a follower, and has given me confidence to pursue ideals and create challenges for myself...to become an effective 'change agent'.* [on advising] *My advisors were available at all times to discuss my courses and offered support and critical reflection about the choices I was making. None of my other educational experiences outside of CNR have ever been as supportive as CNR! When I decided courses I wished to take my advisor made me feel that I was in control of my education and respected my opinions. While at the same time he made me reflect and defend my opinions through critical analysis of my reasoning.*

I can't thank the CNR Department enough for allowing me to pursue my educational goals. My life has been so rewarding and challenging as a result

of my experiences while in CNR. I sincerely believe that my success and sense of fulfillment are a direct result of my positive educational experience as a CNR major."

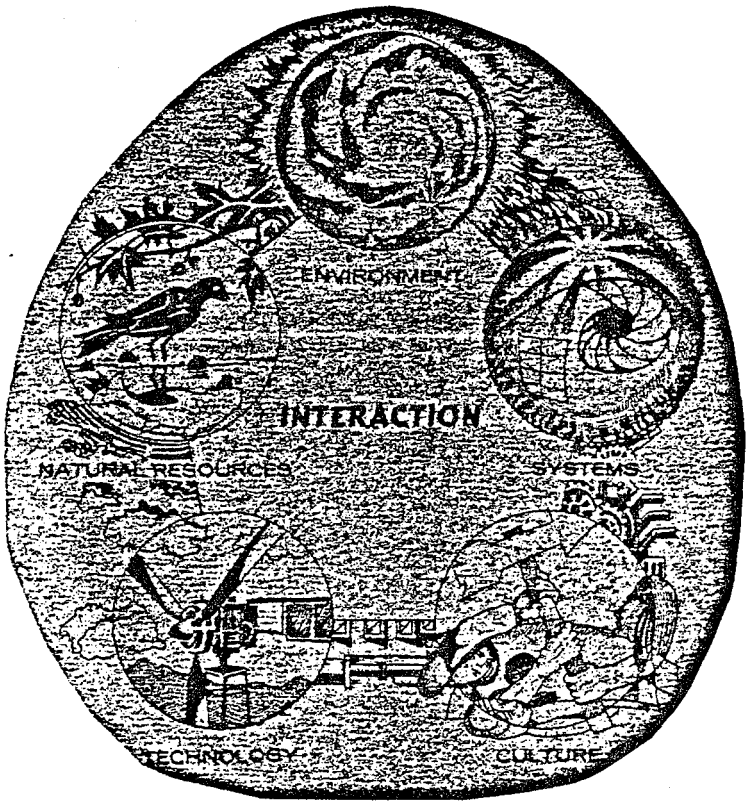
A minority graduate (1976) who has earned a law degree, and is currently a graduate law clerk, and the recipient of the prestigious Reginald Heber Smith Community Law Fellowship, writes about his education in CNR: *"The openness, energy and truth-seeking drive of CNR people* [faculty, staff, students] *allowed me to share a sense of dignity and value...to an otherwise unpopular viewpoint.* [His 'Area of Interest' in CNR was 'Urban Communities'] *The CNR philosophy and ecosystematical perspective is readily applicable to 'unrelated' urban problems. This was/is obvious in my work providing legal assistance to low-income tenants, minority issues that require organization and advocacy, community organizing, and even straight legal thought...*[with respect to CNR courses like the IDS-10 series, CNR-49, and CNR-149] *The open discourse* [in these classes] *was especially refreshing in a University where much of classroom activity is staged in stifling tradition...The topics of discussion significantly challenged my creative energy...*[with respect to advising] *I had an especially sensitive faculty advisor who provided guidance and rational suggestions in forming an area of study uncommon even within CNR.* [on the later general influence of CNR education] *I have since strived to add quality to my life, which includes my environment. In particular, I have led efforts to change situations with much success* [he is an acknowledged leader in the Latino community in San Francisco], *because of my sensitivity to the ecosystem and its environmental limitations."*

A woman (1975) who has been variously an environmental consultant, lobbyist, land-use planner, community organizer, ranch hand, and is currently the Dean of Continuing Education at a University in Southern California; and was recently nominated for "woman of the year" comments on CNR's educational program: *I think the foundation of CNR is the key to success after graduation, the concept of interdisciplinarism is vital. Just to think in a system has allowed me to advance further and faster than others. Key leaders in business, government, and education need to think in an integrated manner. CNR should emphasize and train leaders for top decision making careers and positions, whether it be environmental or not...the thinking pattern is ingrained and has served me quite well - keep at it!...I learned how to solve real world situations through other people, across other disciplines, how to research issues, to question authority when appropriate and to integrate my skills and knowledge productively into the 'system'...*[CNR] *allowed for a small supportive community amidst a large sometimes 'cold' university...I still feel a strong connection to my major...* [on the value of CNR's freedom and flexibility]*...I don't like other people telling me what to do or dictating my activities. I needed the flexibility and I feel I used the opportunity productively.* [on the advising system] *Great! It took away the gap between faculty and student...I appreciated the response I had, and still have, with my advisors...and the moral support offered."*

A 1977 graduate (male) who owns a Passive Solar Water Heating Business reflects on the CNR program: *"I feel the CNR program offers the kind of education that our society and world needs. Interdisciplinary programs, such as this, should be expanded within the University which suffers from over specialization and narrow definitions of 'education' and career opportunities. We need more motivated, informed people effecting change in society, and the*

CNR program is the perfect catalyst toward these ends...[he responds with respect to CNR's flexibility] *An asset. It allowed me to become a leader in a new field."*

A woman (1977) who is a self-employed rancher offers these perceptions about the CNR program: *"The CNR interdisciplinary concept is an idea before its time. I hope for the sake of the future, that schools and their administrations will understand the need for 'whole' person-minds. That is, people who think in terms of the total rather than the specific. Many students in the more traditional majors never have an opportunity to even come in contact with ideas different than what is taught in their specific major. Too bad, because think of all the good arguments and discussions one could have if more persons could come together under the roof of higher education.* [on CNR courses] *Most vividly, the IDS 10 series stands out as the best...it was my first exposure to such high quality speakers and guests. These concerned people really made me stop and take a real look at the world. Before* [the IDS 10 series] *I felt I was looking at the world through rose colored glasses."*



Part II. Curriculum and Teaching

Though we can think of the objective manifestations of 'curriculum' as those aspects of the CNR program that are called courses (e.g. regular courses, independent studies, student initiated courses, field studies, and internships); when we view the program from the perspective of its impact on people's lives, 'curriculum' cannot be so readily separated out. In individual or collective instances, when the program is functioning well, all of its aspects interpenetrate to form a systematic and coherent whole - a holistic education within the facilitating and supportive framework of CNR.

Part II consists of five sections: 1)Interdisciplinary Study; 2)Flexibility and Responsibility; 3)Courses and Teaching (A-Regular Courses and Teaching, B-CNR Required Core Courses, C-Independent Studies, including Internships); 4)CNR Students' Grades; 5)Grants and Awards.

1. Interdisciplinary Study

"The trouble with our times is that the future is not what it used to be."

Paul Vallery, French poet

"Science presents serious social problems for all of us, but scientists rarely present solutions. It is 'people'- nonscientists - who support and by that support make possible science and its applications. It is these same people who must come to grips with, and live -(or die)- with, those problems. They even more than scientists, must come to realize that they bear the responsibility for the problems, and must somehow learn to control science and the technology it spawns if they are to survive...the general level of scientific literacy (a general non-mathematical understanding of enough of the content and method of the various sciences to match our 'literacy' in the other important aspects of life) is woefully inadequate for life in a scientific age.

We must turn to our general education process at every level, from kindergarten to college, with technology and humanism integrated into a common culture, if we are to flourish - even to survive - in these perilous times."

Robert R. Wilson,
Professor of Physics,
Columbia University;
former director Research Division
Los Alamos Laboratory - 1981.

The purpose of this section is not to develop the underlying rationale for an interdisciplinary or transdisciplinary education but rather to stress its relevance for our times and to examine how it affects persons who are, or have been, in the CNR program. The basic rationale and epistemology have been well presented in many places.[5] We have already noted how interdisciplinary study lies at the heart of the CNR program. In this characteristic alone CNR is quite distinctive. Interdisciplinary studies of all kinds accounted for only 3.7% of the Bachelor's degrees awarded by American colleges and universities in 1977 (up from 1.8% in 1972).[6]

The value of an interdisciplinary education in these times can not be overstated. Two general conditions stand out: 1) the increasingly complex and critical state of our contemporary world, and 2) the accelerating changes in societal needs, and their reflection in shifting job markets.

The world is becoming increasingly complex, indeed well-nigh incomprehensible. George Bonham, chairman of the National Task Force on Education and the World View, states; "We are dealing with a puzzle of extraordinary magnitude...we now witness an entirely new stage in world development; and yet we hardly see it at all. We fail dismally to unhook ourselves from ideologies that are no longer consonant with the new motor forces of world events. We stubbornly cling to easy dichotomies - East-West; Capitalist-Communist; the haves and the have-nots - and we fail to see the true world of vast new multiplications of cultural forces in which the old ideologies are not only incorrect, but keeping them may lead to disasterous consequences."[7]

The challenge for Americans to develop a broad (interdisciplinary) understanding and world view consistent with current realities presses upon us even as events continue to consume us. For example, Cyrus Vance, former Secretary of State, in a recent speech at Harvard stated that: "...if, blinded by the new nostalgia, we fail now to shape our future, the puzzle will be [for future historians] why we reacted against change in the world and did not seek to shape it. The historian will then conclude that ours was a failure not of opportunity but of seeing opportunity; a failure not of resources but of wisdom to use them; a failure not of intellect but of understanding and will."

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5. *For example, see former U.C. Regent Gregory Bateson's book Mind and Nature (E.P. Dutton, N.Y.: 1979), especially his memo to the Regent's Committee on Educational Policy in the appendix (page 217-226) dated July 20, 1978.*

6. *National Center for Educational Statistics, Digest of Educational Statistics, 1975, 1978.*

7. *George W. Bonham, Education and the World View, Change - The Magazine of Learning, Vol. 12, No. 4, May-June 1980, page 2-7.*

Increasing numbers of CNR students are rising to this challenge through the courses and independent projects they have chosen, far in advance of the University's ability to respond in a programmatic way. Many of the key issues of our time, that have profound local, national, and global significance, are the challenges that CNR students and graduates have accepted - energy, natural resources, health, environment, food, population, human rights, and technology. These topics do not fall readily into the established framework of academic disciplines. CNR students, for the most part, are noteworthy exceptions to college students in general, who are woefully ignorant about the world they live in.[8] Interdisciplinary knowledge concerning these key issues is critical for our survival and the planet's ability to sustain human life.

CNR students and graduates in evaluating the interdisciplinary aspect of their education repeatedly stressed how much they valued their development of a systematic and broad world view. A free-lance writer (1972) comments; *"I wanted a broad interdisciplinary education and I got one. I wanted a sense of understanding what was going on in the world...Interdisciplinarians must blaze their own trail in the economic jungle...there is risk of despair in facing environmental problems. I've seen fine minds totally blown out by this - but not in CNR, since people learn specific ways of dealing with specific problems."* A 1979 graduate states that: *"the program develops a very good multi-factorial analysis within which one can attack a wide variety of interrelated issues."* CNR students, on the whole, tend to develop this understanding within the context of an emerging ethical position which is essential to the rational exercise of one's social responsibility as a citizen of a democratic society. An alumnus who is in an interdisciplinary graduate program in the social sciences states it this way:*"One of the shining virtues of CNR is its commitment to the necessity of an interdisciplinary approach. It is this commitment which provides CNR students with a way to understand and deal with specific environmental problems as well as the larger social-ethical issues."* Others expressed this sentiment in much more concrete ways. For example, a woman (1977) who teaches in an alternative elementary school says; *"I found myself trying to recognize all interests involved in a problem, and, also, to understand what motivated these interests. Such knowledge, coupled with the scientific/technical will result in a more agreeable compromise...I felt very secure* [in the CNR community] *knowing that I wasn't the only person trying to make the world better. I came to realize that my dreams are possible in the fields of education."*[9]

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8. *Educational Testing Service, What College Students Know About The World, Council on Learning, New York, 1980.*

9. *In many instances when reporting graduates' assessments we will include more than their comments on the specific question at hand to provide both context and a better sense of the overall impact of CNR in each individual case. They represent a cumulating body of data as an integral part of this study and analysis.*

Linked with a broad understanding in an explicit ethical context we find that students are also developing a whole new way of thinking about problems and the world. Students and graduates variously referred to this phenomenon with phrases such as 'systems thinking', 'holistic thinking', 'integration and synthesis', 'how to ask the right question', and 'being able to study many contributing factors and bring them together in a single perspective'. One systematic development of this mode of thought can be found in Gregory Bateson's previously cited book Mind and Nature. Many graduates believed that gaining this perspective was the single most valuable aspect of their CNR program. A woman attorney (1974) is emphatic; *"I learned a whole new way to think!!...It has to do with all legal problems - not just environmental law."* Another self-employed woman who prepares environmental impact reports on a consultant basis says: *"The most valuable lesson [I learned in terms of] my work for the past nine years."* While a 1976 graduate who has earned an interdisciplinary Master's degree in the social sciences and is currently a candidate for an interdisciplinary Ph.D. in Human Development and Aging at the University of California, San Francisco puts it simply; *"A systems approach is basic to my intellectual field and life."* A man (1976) who consults as a Policy Analyst reflects as follows; *I entered the CNR program with very little knowledge of ecological processes and problems, and I was surprised at how fast I was able to grasp a good understanding of these concepts through the CNR program. I was also impressed that social, economic, and political processes were emphasized as much as natural ones, with the student having the option to pursue any of these in depth...I have found the comprehensive approach to analyzing a problem directly applicable to my present occupation as a policy analyst."* He goes on to say, *" ...if I ever have children I hope they have the opportunity to participate in a program like CNR."* Some graduates, like the following independent film maker (1976), while noting the career limitations for people with a broad interdisciplinary education, are apocalyptic about its vital place in the world; *"In this day when employers are seeking specialists, a CNR student who receives a well-rounded education in the sciences is at a serious disadvantage. On the other hand, the day is coming when alternative scientists, writers, engineers, etc. will be urgently needed to save the world, and CNR has to stand and bow to the applause for working so diligently on this matter."*

CNR students and graduates tended to realize and appreciate the fact that CNR often simply laid the base on which to build a specialization in either their careers, or advanced education. For example, a 1975 graduate who is a Systems Analyst for a computer firm states; *"I began developing an understanding - I believe it takes many years in the 'real' world to truly understand the complexities of environmental problems...both environmental and computer problems require a systems approach; i.e. the effect of a small change may alter the entire system in an unpredictable manner."*

The interdisciplinary background available in CNR, which students were encouraged to anchor in a principled ethical ground, has led many to pursue careers and studies where they are making conscious positive contributions to the world which would not have been otherwise nearly as possible. An examination of a few graduates will concretize this. A 1974 graduate who is now a clinic physician in a rural health center in Alabama, was an undergraduate concerned with developing a broad interdisciplinary understanding and "ecological approach to health and disease." As an undergraduate he created an internship for himself that allowed him to visit and extensively observe a dozen rural helath clinics around the country, and study their character and problems and how they were attempting to solve them. This experience was seminal in his education. CNR enabled him to develop the essential understanding and commitment to meet the health needs of the rural poor. This would have been virtually impossible in a standard pre-med program. He states; *"I didn't want to be an ordinary pre-med student locked into some sterile program with no relevance to anything but getting into med school."* His broad systems approach, even today, extends widely as his position as a physician is an integral part of a larger effort - the pioneering Elk River Development Agency - whose comprehensive program includes solar power development and [cooperative] agricultural marketing.

A woman (1972) who has just completed her Ph.D. in Geography at U.C. Berkeley, and whose Area of Interest while in CNR was Biogeography provides another outstanding example. She is embarking on a career in the field of international environmental and developmental issues. In CNR she developed a solid background in the biological sciences, earth sciences, and the social sciences. She says, *"this was definitely superior to selecting one or the other* [biology or geography as a major]." During the past four years she has been undertaking research on the exploitation and conservation of natural resources in a tropical country (a Tropical Science Center in San Jose, Costa Rica), while at the same time acting as a consultant to A.I.D. on conservation of natural resource issues for over a year. This woman who was the keynote speaker at the College of Agriculture's graduation ceremony in 1972 comments about her CNR education; *"...I feel now, as then, that our major is necessary, with all its present flexibility, for the creative and diversified learning essential to future careers involved with the analysis and resolution of environmental problems. This interdisciplinary and innovative major, now a decade old, deserves to live on. Viva CNR!"*

A more recent example is a 1977 graduate whose subsequent work once again, illustrates the unique interdisciplinary potentials of CNR. While an undergraduate, her Area of Interest was 'Demography - Populations Studies'. She states; *"I feel I got a good grasp of the relationship of population to environment, society, and the economy...My program at Cal was both well-rounded, yet specific in my particular area...I got excellent training...I went into graduate school far better prepared than anyone else in the field of population. It was only through CNR that I could* [accomplish this]*...the macro approach to problem solution which I was exposed to in IDS-10*

and CNR-149 is rare among undergraduate majors. I did not feel that the stereotypical environmentalist viewpoint was the only approach offered...I appreciated that the social aspects of a problem were considered as well as economic and 'environmental'." She has a Master's degree from the University of Chicago, and is currently completing a Ph.D. with Kingsley Davis, one of the world's leading scholars in her field, at the University of Southern California. Her interdisciplinary education in CNR has assisted her in bringing fresh perspectives to the problems in her field. Her concern is with macro issues in population studies - e.g. racial and ethnic conflict, income distribution, economic development, and its social and political consequences. *"My work involves 'social conscience'...My dissertation will concern the impact of foreign aid and investment on Mexican development. My concerns are the analyses and promotion of development (not westernization) in Latin America."* During her period in graduate school she has participated in and conducted developmental field studies in El Salvador, Guatemala, and Nicaragua.

One more example of the distinctive contributions of CNR's interdisciplinary program to the creative solution of significant social-environmental problems is the work of the woman who has become a leading authority on recreation for the disabled. She was quoted in some detail in the previous section (see page 27). *"My framework for focusing on issues reflects my CNR education. I see the problems and potentials of the disabled population as part of larger interrelated issues... [CNR] enabled me to understand other complicated issues in my field in their social, economic, and political contexts."* She makes it very clear that the breadth she gained in CNR, in conjunction with her socially responsible involvement in the community as part of her CNR program, provided the background and insight that allowed her to make pioneering contributions to the recreational needs of the disabled (see page 27 for more detail). These were solutions and the development of programs recreation professionals from hundreds of traditional undergraduate and graduate recreation programs all around the country had not been able to either conceptualize or enact in practice.

The picture that emerges from these CNR graduates, and from many others who will be cited at length as this study evolves, is one in which persons have gained a broad interdisciplinary understanding of the world they live in which has yielded rich consequences in their later careers and lives. It is interesting to note that a large percentage of CNR students construct for themselves a much broader general education than most students in Letters and Sciences gain (e.g. see data on pages 14-17). What is perhaps unique in CNR, even among interdisciplinary programs, is that this broad general education is set in the context of developing systematic knowledge, and analytical and practical skills essential to both understand and solve

environmental problems (broadly defined). Not just in theory, but also in the arena of actually working to effect the solutions in the world in socially conscious and responsible ways. That is, the broad understanding is focused on enabling persons to understand and to act responsibly to foster positive change in the contemporary world. This was found to be challenging and empowering by a substantial proportion of CNR's students and graduates.

Another major impact of CNR's interdisciplinary program is the potential it provides for an effective mix between 'academic disciplines' and 'instrumental programs' in a flexible way that meets contemporary societal needs, changing job markets, and the traditional goals of a liberal education.[10] Most'academic disciplines' do not lead to a distinct labor pool with a Bachelor's degree, especially with the current scarcity of positions in education at all levels that traditionally absorbed large numbers of graduates from 'academic disciplines'.[11] The instrumental programs', on the other hand, tend to lead to one distinct labor pool, and these programs are usually short on satisfying traditional broad liberal educational goals. The current vocational trend in higher education in the United States, which is reflected in increased demands for, and enrollments in majors like'business' and 'engineering' at Berkeley, poses a significant threat to the traditional strength and prestige of colleges and universities in the United States. Roger Geiger of the Institution for Social and Policy Studies at Yale University states the problems as follows: "No consensus seems to exist any longer on the cultural content of general education; the organizational imperatives of academic disciplines are oriented toward the relentless pursuit of new knowledge, not the integration or interpretation of what is already known; and market forces seem to favor vocationalism regardless of its validity. Yet, shaping the intellectual maturation of young people and widening their cultural horizons has traditionally

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10. *'Academic disciplines' are those programs in intellectual disciplines like history, physics, psychology, etc. that are not explicitly job specific at the undergraduate level; 'instrumental programs' are those like business, forestry, and engineering that are occupationally specific.*

11. *Thus, graduates from disciplinary programs who do not go on to graduate or professional school, and who cannot, or do not go into teaching, are thrown into a single undifferentiated labor pool of college graduates. In this pool what is learned in 'academic disciplines' in the college classroom has little direct bearing on the activities of their workplace.* ['academic disciplines accounted for forty-two percent of all persons graduating from American colleges and universities with Bachelor's degrees in 1977 (399, 100), down from fifty-one percent (324, 900) in 1968 . *This phenomenon pretty much accounts for the twenty-five percent of U.C. graduates in general, compared to four percent of CNR graduates, who state that the knowledge and skills they learned in college are of no value in their present employment* (see page 22).

been the strength and mission of American undergraduate education... this [the current trend toward vocationalism on the one hand, and increasing isolation of the research sector in elite institutions on the other hand] is not an attractive prospect."[12] The CNR program appears to offer an effective antidote to the dilemma posed by current trends in higher education in the United States.

The reflections of a 1978 graduate captures these possibilities very well. *"CNR is a bright spot of individuality and freedom shining in the dark sea of conformity and repression in the University network...This flexibility and freedom is very important in today's fast changing world. Educational demands change much more rapidly than the university's responses; in CNR the student can modify his or her own if need be. This privilege, this freedom of choice, should be foremost in the minds of all CNR students - they should not make choices frivolously. Only through responsible planning will CNR and its students remain in such a rare status."* How has he capitalized on CNR's potentials? His Area of Interest in CNR is characterized as follows: *"Public Environmental Health. I incorporated a broad array of physical and biological science courses with conservation and resource studies in an effort to gain a good understanding of environmental health problems, and their control and/or solutions."* Currently he is completing Optometry School at U.C. Berkeley, while at the same time planning a research program on the effects of airborne pollutants on visual performance. This is one more example, among many, of how a CNR education combines in unexpected ways with traditional professional school programs to address significant, or potentially significant, environmental problems. These imaginative combinations by their very nature, could hardly be predicted ahead of time and accommodated in a pre-set program, not even in an interdisciplinary one.

The business of a 1978 graduate illustrates a very different combination of 'academic disciplines' and 'instrumental courses' that led to environmentally responsible behavior that was derived from a broad interdisciplinary understanding of environmental problems. This graduate's Area of Interest was *"related directly to [his] tree business and how [he] could continue to serve the community while considering all aspects of [his] business's relationship to the environment."* He is the owner of a moderate sized tree business which prunes, plants, tops, removes and fertilizes trees for private individuals and businesses in the East Bay. He goes on to state; *I designed my Area of Interest to allow me to consider all aspects of a business which works directly with the public and the environment. I wanted to find out how to do it right (i.e. run my business) in the face of mounting environmental problems."* How has this affected his business? He reveals some of the effects in the following comment: *"Since*

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12. Roger L. Geiger, The College Curriculum and the Marketplace, Change - The Magazine of Learning, Vol. 12, Co. 8; Nov-Dec 1980, pp. 16-23. This article contains a discussion and analysis of the issue we have been discussing.

graduation I have been able to scale down my operation while doing an even greater volume of business. I credit the understanding I gained in CNR concerning conservation of energy and materials with allowing me to see future problems and avoid them. My equipment is now more suited to the job.... I now use less energy and accomplish more.... It feels good to be a CNR graduate!" Is this not as valid a use of a CNR education as going on to gain a graduate or professional degree? CNR has clearly met diverse needs uniquely and productively.

Several of the points we have been making and documenting are succinctly summed up in a report written by Kim Hansen in 1977, while she was still an undergraduate in CNR, entitled The CNR Student and Work Hereafter. This report reviewed and commented on follow-up material gathered from a substantial number of CNR graduates. From the report: *"The ones to be pitied in our society are those who have been so 'specialized' that they become psychologically inhibited, thinking they are trained for merely one certain occupation and that is what they must do. How much individual personal growth is stunted by this way of thinking? There is so much potential within each human being that ought to be allowed to develop and bloom, in the process of finding one's life work...To the CNR student who might ask, 'What job can I do?' the question is returned ' What purposeful activity do you see happening around you that you want to get involved in?"*

The overall value CNR students and graduates place on their interdisciplinary education, as well as the degree to which their goals in this area were met, is reported in the previous section. It is noted here that all indices were positive and absolutely and comparatively high (see pages 9-29). In conclusion, the interdisciplinary character of CNR has been shown to serve important contemporary educational and societal challenges in unique and effective ways. The significance of this, and other aspects of CNR, can be far more fully understood and appreciated by viewing them as interpenetrating aspects of the whole. That is, each part of this study will function to further define and explicate every other aspect to contribute to shaping a comprehensive picture of CNR as it impacts the lives of its students and graduates. Therefore, no section can stand complete on its own.

2. Flexibility and Responsibility - including critique of academic program

Flexibility is one of the key characteristics of the CNR curriculum. Only four of five specific courses are required beyond minimal University-wide requirements: CNR-90 Introductory Seminar, CNR-149 Senior Seminar, and the IDS-10 A,B,C series - an interdisciplinary overview of environmental issues and problems (a course from a wide range of alternatives can be substituted, and frequently is, for one of the courses in the IDS-10 series).

Other specified areas within the course of study are broad and offer students almost unlimited choice: Humanities, Social Sciences, Physical Sciences, Biological Sciences, Mathematics/ Statistics (3 courses in 4 out of the 5 areas, and 6 courses in one of the chosen areas); reading and composition (2 courses); and Area of Interest (10 upper division courses).

The flexibility in choice of curriculum and the attendant responsibility this entails is more highly valued by CNR students than any other aspect of the program. This report documents in many places and in telling detail the wise, creative, and responsible use made of this freedom by the great majority of persons who have gone through the CNR program.

Flexibility - the data and discussion

In the 1976 student initiated survey students were asked: What features of CNR are most important to you? and were provided with a blank space to respond. The responses from 225 students were categorized. The two categories into which most of the responses fell were both associated with flexibility: Structural freedom or flexibility (e.g. "lack of restrictions", "opportunities", "freedom") was mentioned by 55.2%*of the students; Individualized (e.g. "self-defined", "own area of interest", "creative") was mentioned by 33%. Other categories were: Community and atmosphere 24.5%; Subject matter and philosophy 23%; Close student-faculty contact 19%; Interdisciplinary 16.2%; Holistic 14.6%; and Job opportunities 2.3%.

*The categories are not mutually exclusive as some persons mentioned more than one feature.

Berkeley undergraduate students and CNR graduates were asked the following question: There are enough course plan options within the department/program to meet my specialized interests in the subject matter. [CNR Follow-Up: There were enough options within the program to meet the needs within my area of interest].

Enough course options within program: Means CNR and Comparison groups

CNR-ARU.....4.73	Life Sciences-ARU(18).....3.57
CNR Follow-Up.....4.43	All Programs-ARU(40).....3.45
Rank CNR.....1st	Range.....1.98 - 4.73

What emerges from this question is the significant finding that CNR students with CNR graduates concurring were better able to meet their specific academic interests than students in any other program on campus (this is a very reasonable extrapolation from the 40 programs surveyed). We must note that students in specific disciplines were far less able to meet their special interests in their disciplines than CNR students were in their

Areas of Interest (e.g. the Mean among the Humanities programs was 2.89; Life Sciences 3.57; Social Sciences 3.64; while CNR's was 4.73). It would appear that having the whole University to choose from, with minimal restrictions and ample opportunity for use of focused independent studies, has the obvious advantages that few students outside of CNR are able to fully capitalize on.

Value of flexibility and responsibility

CNR students in the 1980-81 survey, and CNR graduates in the Follow-Up Study were asked: CNR is characterized by its flexibility and the necessity for persons to take responsibility for the development of their own course of study. Do you value this opportunity? [CNR Follow-Up: Was this important to you at the time?]. CNR graduates were further asked: Is the flexibility you experienced in the program an asset to you now? A hindrance? (n.b. we asked for narrative responses in the follow-up study, instead of ratings, in order to better ascertain the sources of people's judgements. Responses were categorized as indicated below).

Value of flexibility and responsibility

CNR 1980-1981 Mean = 4.80

(5) Extremely so 84%; (4)13%; (3)2%; (2)1%; (1)No 0%

CNR Follow-Up (value at the time) Mean = 4.83

(3) Very Beneficial 94%; (2) Not Important 1%; (1) Hindrance 6%

CNR Follow-Up (asset or hindrance now?)

(A) Asset 60%; (B) Both an asset and a hindrance 22%; (C) Of no particular later consequence 5%; (D) Hindrance 13%

It is unmistakable that CNR students, past and present, value the flexibility in the CNR program and the responsibility it entails. No other single dimension of the program was rated as high as this one. Given the extraordinary high regard that students held for the program's flexibility, it will be instructive to determine more precisely the nature of the hindrance experienced by a small minority; and why the graduates tended to judge this aspect a hindrance to a significantly greater degree than either their own reports of its value while in CNR, or judgements of current undergraduates.

A. Analysis of Current Undergraduates' Narrative Responses (1980-1981 Student Survey). A central theme that emerges is that flexibility, interdependently with other aspects of the CNR program, is empowering. People place great weight on the value of choice and the ability to be in control of their own educations. "I want

to be responsible for my own education. I want to discover what I feel is important to me, and then have the opportunity to pursue it." A young man states, *"It* [flexibility] *is empowering, sane, logical, and different."* A young woman responds, *"I believe it* [flexibility] *is fundamental to a personally meaningful education."*

Many emphasize that they are the ones who are best able to determine their own interests, and they cherish the opportunity CNR provides to pursue them. For example, *"I know what I want to do and what kind of information I need to do it. I can't get this anywhere else."* Students are very aware of CNR's uniqueness and have transferred from other majors and universities in order to pursue their special interests, rather than be "programed".

People repeatedly indicate how the flexibility in CNR has made them conscious for the first time about the importance of taking responsibility for their educations and lives. During this process they have become very conscious of their education, and committed to maximizing its value for them while at Cal, rather than going along with a structured major without much critical thought. They experience this as a stimulation to their intrinsic motivation, and as releasing their creativity in productive directions. Students tend to understand the critical relationship between flexibility and responsibility. The important act is that they chose to be responsible, rather than being expected to be responsible to someone else's dictates. *"...learning to take that responsibility* [associated with freedom of choice] *has been one of the most rewarding experiences of my education."*

In the narrative data in the 1980-1981 Student Survey eight percent of those who responded mentioned that though they valued the flexibility in the program, they felt it was relatively easy to avoid important guidance, and the development of sufficient focus. At the same time only a couple of students expressed the need to be pushed a little more. Curiously, a number of those who raised the above two points did so in the context of referring to unspecified others, rather than themselves. In contrast, many, many more persons mentioned and appreciated the fact that their freedom and responsibility was set in a situation with excellent faculty guidance and a very supportive CNR community. Some even saw losing focus as a positive stimulant, as indicated in this student's comment, *"I value the opportunity to develop my course of study, but I have found at times I stray off course. I constantly have to evaluate what I am doing. This is good."*

It emerges clearly from these responses that students see and deeply appreciate their freedom of choice with responsibility, in a supportive setting with guidance. The vast majority use it with thoughtful intentionality, and see it contributing immeasurably to the quality of their education and lives.

Is there any compelling reason why it should be otherwise? Many critics tend to claim that such subjective effects are transitory, if not illusory and unrelated to disciplined learning. This can be put to test, in significant measure, by the analysis of the narrative data obtained from the graduates of the CNR program.

B. How CNR graduates assessed "flexibility", when they were students and how they see it now. CNR graduates valued "flexibility" when they were in the program just as highly as current students do (94% found it beneficial at the time), and for the same reasons. Graduates' views of the long range effects of "flexibility" presents a much more complex picture. However, over eighty percent of CNR graduates consider the long range impact of the flexibility to still be an asset to them.

1. Sixty percent of the graduates judged the flexibility they experienced in CNR as an unqualified asset to them now. Their responses cover a wide range of impacts, far too numerous to thoroughly explore here. One important reason for it being an asset while in CNR, and later, which was frequently mentioned, was the ability it gave one to adjust one's program as his or her interests changed or became refined. It is neither unusual nor unreasonable for a person's interests to shift as a result of course work and field experiences in the pursuit of an exciting and satisfying course of study and career. One of CNR's most valuable and unique features is that it structurally allows for students' naturally evolving interests to develop from broad general concerns (e.g. as exemplified in the IDS-10 series) into a wide array of individually defined focuses. A significant proportion of all undergraduates at U.C. go through a similar evolution; but find it difficult, if not impossible, to follow through because of the limited flexibility in their programs (e.g. see data in table "enough course options" on page 39). A woman who graduated in 1976, and is now a professional labor educator in the field of occupational health and safety states it clearly: "[value of flexibility] *Yes, it is what drew me to the major.* [now] *Asset - allowed my area of interest to shift slightly as my interests became more defined. My coursework seemed a logical progression, whereas in majors with more strict curriculums I would have been confined (or forced to change majors).*"

The flexibility in CNR has turned out to be especially important to a number of graduates who went on to interdisciplinary advanced degree programs, often fashioning their own program in graduate school as well. For example, a young man who graduated in 1976 and is completing a Ph.D. at U.C. Medical School, San Francisco, in human development and aging with a broad range of professional interests in clinical work, preventative medicine, and holistic health, states with respect to flexibility, "[then] *Absolutely crucial and extremely valuable. An excellent challenge...*[now] *An asset! My M.A. is in interdisciplinary social sciences, and my Ph.D. is also interdisciplinary.*" Another example is the young woman (1977) who is a PhD candidate in Sociology (Demography) at the University of Southern California and was quoted at length earlier in this section on page 34 and 35. She states emphatically, "[flexibility-then] *Yes, absolutely! It was only through the CNR program that I could study demography/population studies as an undergraduate.* [now] *An asset as...my program at Cal was both well-rounded, yet specific in my particular area - and I got excellent training...I went to graduate school far better prepared than anyone else in the field of population.*"

Perhaps the most significant long range contribution of flexibility, in conjunction with other aspects of the CNR program, was its impact on the manner in which graduates 'became' in the world. This had important effects on their academic pursuits, careers, and lives. For many it put them in essential touch with their individual and collective responsibility in life. At the same time it facilitated their initiative and motivation to do well, and to attempt to make a significant difference in the world. Graduates repeatedly emphasized that the way they were asked to 'be' in CNR reflected the way they had to 'be' in the world if they were to succeed in careers and life. These are essentially the same values cited by current undergraduates. This section will provide affirmation for the wisdom of undergraduates' understandings. For example, a 1975 graduate who is very satisfied with his career as a manager of a moderately sized business that distributes Herbs, Herbal Products, Teas and Spices captures this sense quite well. He speaks to the value of flexibility: "[then] *This was essential for me since it was my money and time going into those four years. Why go through a program that is so structured you have to take certain courses and then discover that it is not what you really want...*[now] *Definitely an asset, when you get to make choices affecting your life, you are the only one responsible for any poor choices or good choices; but you get to make those choices because you'll always have choices in your life, and learning that the ultimate responsibility for them is yours is very satisfying.*" A graduate student in Architecture at U.C. Berkeley (1979) expresses it as follows: "[flexibility] *This was and still is extremely important to me. I feel that CNR is the one major on campus that really asks the students to think and act in the world in a way they will have to do once they are out.*" From a 1977 graduate whose Area of Interest was Community and Environmental Health, and who is now completing Nursing School at U.C. San Francisco: "[flexibility-then] *Very important. Looking back on my education, I can see that I really took responsibility for my own education and took very few 'goof-off' courses, if any. I had a multifaceted approach to my education.* [now] *Definitely an asset because I still work within that framework...My previous education in CNR fits in well with this new curriculum* [nursing curriculum]" A landscape architect (1977) comments: "*I strongly respect the responsibility I was given to plan and take charge of my education...it was MY education!* [now] *Yes, I'm very self-directed and responsible for my actions - motivated to search for answers.*" She offers the following encouragement to CNR: "*Let's do more than 'understand/question': Let's develop tools that allow the principles of CNR to flourish!*" A graduate who is now an Optometry student at U.C. Berkeley puts it like this: "*It is an asset* [now] *I call it thinking on my feet. It gave me the ability to look at where I am, where I want to go, and ways to get there. The world is never constant - so flexibility is crucial to dealing with the world.*" From a woman (1978) who is working on an interdisciplinary Ph.D. in Public Health (integrating biological, environmental, and health fields) at U.C.L.A. :"[flexibility] *Yes, this was probably the most important thing I got out of the program. The major forced me in a way to search for my identity and interests, and once finding them this had to be my most rewarding experience.*" The phenomenon moves in many ways; another 1978 graduate who co-manages a large Re-Use Center (recycles objects at minimal cost to non-profit groups like schools) and is an active, and effective, community organizer, valued the program's flexibility but also remarked that "...*it was frustrating also because when I found*

myself drifting I often didn't get much support, but felt that I was expected to resolve my dilemma myself. [now] *what I learned from my frustration then is an asset to me now - I don't take on large tasks or jobs without knowing my program, my commitment, and so forth, unlike when I was in school. Live and learn!"*

When graduates reflect back on why they valued the flexibility at the time, one of the major reasons given by current students stands out even more - the need to have control over one's education in order to profit maximally from it. Nearly ten percent (9.5%) of the graduates spontaneously stated that if it hadn't been for CNR and its flexibility they would have most likely 'dropped-out' of school. The comments from a county level coastal planner ('77) state this quite simply:"...*if there wasn't some program like CNR offering a similar flexibility I probably would have dropped out of U.C."* This need for control over one's education and life is a recurrent theme that many hold tenaciously to. CNR provides a space these strongly motivated and self-directed persons can flourish in. For example, the following statement from a teacher in an alternative elementary school who is very satisfied with her work and life: *"I didn't want some bureaucracy telling me exactly what course of study I had to take, because they didn't know (or care) what my interests/values are/were. I am the only person that can mold my personality and goals. And I am the only one that can achieve my goals...*[consequently] *It made me push myself harder to get the most out of my education ('77)"* A woman who is finishing an interdisciplinary Ph.D. focused on traditional agricultural forms, and who is co-authoring a book in the area, responds: [was flexibility important to you?] *"TOTALLY! I needed something to validate my approach to my education and allow me almost total control. My interests were such that as an undergrad they couldn't fit into anyone's boxes. CNR allowed me the freedom to develop them and experience U.C. Berkeley. This was very important to me.* [now] *Yes, but I have always felt that flexibility was an asset ('78)."*

2. The responses of the twenty-two percent of the graduates who found the long term influence of CNR's flexibility to be both an asset and a hindrance begins to compound the analysis. An examination of these will expand our analysis of the ways flexibility has been an asset, and at the same time indicate some of the pitfalls and trade-offs some persons experienced.

The most frequent dilemma can be expressed in terms of the asset of having an excellent general education and the hindrance of not having an easily marketable specialization. In a way this is no more than a description of a typical Liberal Arts undergraduate education, and no one seems to be suggesting that they be changed into vocational training programs. This is clearly stated in the remarks of a 1977 graduate who is an office manager in a home remodeling company: "[asset and hindrance] *Both. The flexibility gave me the general education I wanted out of college. I am glad I had such a broad education. On the other hand I wish that I had been encouraged to pick up more technical skills and a stronger science background."* A young man who graduated in 1976 and has been working as an environmental educator in Yosemite National Park for several years, whose interests have begun to shift recently, responds: "[flexibility-now] *Overall*

an asset, but now I see the need for detailed study, technical courses in chemistry, biology, etc., which during CNR times seemed unnecessary. Realistically, you do need a specialty of sorts." Obviously he did not need it to get a professional position as an environmental educator. His comments raise the issue of changing interests, which will be considered in detail later. A 1975 graduate who is a natural resource planner and consultant with a large multidisciplinary engineering firm comments on flexibility: "[then] *An asset - CNR allowed me to develop the curriculum that eventually led me to a more in-depth study.* [now] *Definitely an asset, but I feel it must be combined with additional emphasis in a particular field."* He goes on to suggest that CNR should perhaps offer a five year B.S. degree to accomplish this, because four years seems too short a time to accomplish both broad and specific goals. The issue emerges again in the case of a young woman (1975) with an advanced degree from U.C. Davis who works as a wastewater reclamation expert (irrigation water reuse), and valued the flexibility in CNR: *" It allowed me interdisciplinary freedom...I followed my interests...*[but] *I don't have an easy 'label' for job hunting...one disadvantage is the lack of sense of importance of basics - freedom let me skip the 'harder' science courses, no one convinced me of their necessity."*

The asset of having a good general education, and the hindrance of not having sufficient specialization were paired with other assets and hindrances, as well. For example, a 1975 graduate who is an administrator in an environmental consulting firm states, *"CNR was of the greatest value of anything in my entire education, due especially to the CNR community...it gave me the feeling of belonging and caring, and a place to channel my concerns while getting a good, creative education."* Her assessment of flexibility: "[then] *Asset! Without this freedom most likely I would have chosen a major that was wrong for me, or even 'dropped-out' of school.* [now] *asset - it taught me creativity and independence; although a hindrance, in that I avoided many 'hard-core' classes like Chem 1A, and found this lack a barrier to further schooling and some jobs."* A woman (1975) who is an agricultural newswriter for the University of Wisconsin, and is completing a Ph.D. in Agricultural Journalism, reflects on the flexibility in CNR as follows: "[then] *Yes, very important. I did not want a straight discipline but rather a broader approach to subject matter. Natural Resources is a subject so broad that a program in this area must allow flexibility in course work.* [now] *Sometimes both* [an asset and a hindrance]. *Extreme flexibility connotes that a student has enough wisdom to choose the right subject matter for an eventual career, and this is questionable. On the other hand, it taught me to take more responsibility for my freedom to choose."* From a construction laborer who has been doing extensive independent scholarship: "[flexibility-then] *Very much. Up until then, my education had been funneled along traditional lines. CNR gave me the opportunity to explore my own way of thinking. At the end of each quarter, I felt it necessary to re-evaluate my position before choosing the next quarter's classes. I was able to modify or redirect, if necessary.* [now-both an asset and hindrance] *It left me with a job-limited yet wide-scoped education. For me it requires follow-up with an advanced degree. However, I obtained what I believe to be a necessary education in environmental awareness."* A 1978 graduate who has been a member of a 'landscaping collective' and just returned to school in a graduate program in Landscape Architecture at U.C. Berkeley comments: "[flexibility-then] *It was very important. I would not have been able to return to school in more rigid circumstances*

because I wasn't ready to be pinned down to a traditional program. I wanted to explore various options and to develop...a broad understanding of environmental issues. [now] *No hindrance, but I have recently found great satisfaction in a more focused disciplined interest in fewer things and activities than when I was a student. I feel that the other side of flexibility - commitment and focus - should also be emphasized.*

A thread that runs through many of these assessments is that a greater specialization or focus would have been desirable. Some speak of this in the context of feeling that they did not have sufficient direction at the time (this is discussed at length in the section on Democratic Structure of CNR and methods of addressing the problem, when present, are discussed in the section on advising); others speak of it as the consequence of their interests shifting toward the end of their undergraduate career (this will be discussed later in this section); still others see it as the inevitable consequence of the breadth of the field of Natural Resources, and accept the logical consequence of additional study to achieve desired specialization. Sometimes appropriate critical dialogue with an advisor might have been corrective, at other times not. For example, a woman (1976) just about to finish law school says of CNR: "[It] *was the turning point of my life* [especially Ecosystemology 110]." She has nothing but the highest praise for her advisor and the advising that she received. She goes on to state:"*The flexibility was a great deal of what I was looking for...looking back...I wish I had focused on certain courses or disciplines...But no real regrets.*" Only a little over ten percent (10%) of CNR graduates indicated that they felt that they had a lack of specialization, direction, or focus that was of some hindrance to them later. These findings for CNR graduates will be compared with those from U.C. graduates in general towards the end of this section.

One area within this lack of specialization that was mentioned most frequently was the lack of sufficient 'hard' science courses, or enough depth in technical and scientific areas. This was true for several persons who saw 'flexibility' as both an asset and hindrance, as well as for some of those who saw it only as a hindrance. However, only 6.5% of the total sample of graduates indicated that this characterized an aspect of their education in CNR, and that it was a hindrance either for later careers or graduate school demands. Equally noteworthy is the fact that very few recent graduates, none of the 1979 graduates, indicated that this was a problem. The extent to which it was a problem in the past seems to be largely rectified now. In part, one suspects the tightening economy has moved undergraduates generally to take the question of focusing on a career more seriously; while at the same time many additional advising sources have been added to the program in recent years - an active Resource Center with job/career files and placement assistance, a vital student organization and alumni network, more faculty and courses in CRS, Area of Interest groups (since 1979), more emphasis on community work and internships, and a generally more serious and focused tone in the CNR community.

In programs like CNR there is a tendency for outside forces, sometimes within as well, to pressure for more required courses; especially for more 'hard' science courses. Nothing in this section, or this study as a whole, suggests this would significantly improve the CNR program; while the evidence that it would significantly injure the quality of the program for many is substantial. At best, a number of required basic science courses would have directly benefited less than seven percent (7%) of the graduates. The overwhelming majority of students who will later need a strong basic science background choose to obtain one. We can only conjecture how many students would have been restricted in the development of their many and diverse special focuses which did not require a strong basic science background, if a specific set of basic science courses were required in place of the current flexible set. Even among the ten percent, or so, of the graduates who expressed, in retrospect, the wish that they had had more direction, or chosen to develop a more specific focus; nearly half spoke of directions and focuses more centered in the social sciences and humanities. The situation, to the extent it remains a problem, can be adequately addressed through: strengthening the orientation to the program (especially CNR-90) so expectations are more in line with possibilities, increased and more adequate information about the background required for various career choices, more challenging dialogue within the advising structure, and encouraging those who clearly do not belong in the major to either not enter it in the first place, or to transfer out if they are already in it.

Indeed in instance after instance it was the flexibility and broadness of the CNR program that shaped peoples' careers and lives, and for many led them to hit upon the focus and specialization that brought them satisfaction and success in their careers and lives. Others simply remained broad in their program and turned it into an important asset. For example, a woman who graduated in 1973 and is a well known and respected leader in a Sierra foothills community teaches Natural History and Natural Resource courses in the local community college, grows and sells native plants, draws and markets delightful biological posters, and is active in many community groups concerned with the quality of the environment. With her husband and child she is intentionally, *"setting an example of how people can live with the environment, instead of at its expense."* She comments as follows about the flexibility in CNR; *"YES! Finally someone trusted my brain and my ability to make decisions on my own...it was part of my growth toward independence...CNR allowed me at the age of 19-20, to grow and become an informed open person. Now eight years later, if I were to return to an institution I would be more specific, e.g. botany, german, etc... BUT it's because of CNR's openness that I became a well-rounded enough person to have all of the various interests I do today..."*

An additional comparison will serve to compound this analysis. While a number of graduates expressed the following sentiments; *"...it left me with a job-limited, yet wide-scoped education. For me it requires follow-up with an advanced degree,"* to borrow a part of one graduate's

statement; many, many more expressed how their diversified education in CNR opened up wider job possibilities. An excellent example is a woman who graduated in the same year (1978) as the man quoted above. She has a very responsible position with the California-Tahoe Regional Planning Agency, and is very satisfied with her career and life. She reflects on the flexibility in the program, "[asset] *Yes, it helped me prepare for directing my life past graduation. No one else can do it. My background is diversified enough that I can make it sound like several different things. That's an asset in the job market.*"

One further dilemma mentioned by a few students, and probably experienced by several more, deserves mentioning, if only to add a lighter note to our discussion. That is, some difficulty in more highly structured advanced education programs was noted by a few graduates. A women who graduated in 1974 and says of her time in CNR; "*...the education and experience were invaluable. Thank you.* In response to the question about flexibility she comments, "*An asset in that I know how to make choices and know what I want; a hindrance, because I find it difficult to submit to a highly structured nursing curriculum* [she is currently enrolled in an RN/BS program in nursing], *some of which I find irrelevant to my needs.*" Another similar problem is described by a man (1974) about to complete his Ph.D. in Geography at U.C.B.; "[with respect to flexibility - then] *It was absolutely essential to my staying in school...* [now] *but some problem in that I can't accept a strongly structured program of education for my own graduate studies.*"

At least two important conclusions can be drawn from this examination of the responses of graduates who later found CNR's 'flexibility' to be an asset as well as a hindrance. First, virtually all of them were very positive about the quality and value of their CNR education as a whole and gave perceptive voice to some intriguing dilemmas. Secondly, the issues raised are complex and multifaceted. Many of them involve trade-offs that can't be avoided, and that have ultimately turned out to be of significant advantage to the persons caught on the horns of the dilemma.

3. Those people who judged the flexibility of CNR to be a hindrance after graduation - thirteen percent (13%) - did not in general tend to be unhappy with their CNR education. Only five percent (5%) of CNR graduates expressed dissatisfaction with their overall education in CNR (4%-dissatisfied; 1%-very dissatisfied), in contrast to thirteen percent (13%) of graduates in general (Survey of Graduates[1978]), who were asked a slightly different question which tends to elicit more positive responses - "All in all, how satisfied were you with your total undergraduate experience at Berkeley."13

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13. *See footnote number 2, page 9 for detailed explanation.*

The ways in which the flexibility in CNR was a hindrance after graduation were several and complex. A detailed examination of a 1977 graduate's responses will illustrate this complexity. Currently, this young man is in a graduate program in Environmental Engineering. He generally spoke highly of his CNR education. On flexibility he remarks; "[then] *I liked the freedom I had (to a certain extent) but wished my advisor had pushed a lot harder on me to develop a more tightly-knit set of courses.* [now] *A hindrance now, but certainly it has helped me develop the ideas which presently motivate me toward my goals in environmental engineering...I wish I had stressed the technical aspects* [of environmental problems] *more.*"

The paradox emerges when we note that his Area of Interest while in CNR was Environment and the Media and his intent was to become an environmental journalist/reporter. This was not unrealistic, and it is a route a number of graduates have taken very successfully. He comments further; *"I think it is difficult to know right away what one wants to do when he begins studying an area as large as 'environmental problems'...For me, and probably for lots of others, developing an Area of Interest is an on-going process, not one that ends with graduation. A cohesive, strong Area of Interest may take eight years to develop, not four."* He goes on to recommend, *"that some hard-core classes like physics and chemistry and calculus be required...a strong technical background can't hurt for someone who will be considering environmental problems over future years and probably decades."* What he neglects to take account of in his analysis and recommendations is that his interest shifted from "Environmental Media" to "Environmental Engineering" after graduation. Environmental Media could be pursued from a strong social sciences and humanities background, as well as from a strong technical and scientific background, depending on one's interests. What emerges is that persons whose interests mature slowly, and shift markedly near or after graduation are, understandably, somewhat ill prepared for their new directions. But this could happen in any major. We will examine comparative data at the end of this section that suggests that it happens much more frequently in most other majors, than it does in CNR. For example, if his interest shifted to Environmental Psychology (there is such a field), would he be recommending that a strong technical and hard science background be required?

A young woman who graduated in 1979 went through an equally dramatic shift of interest, but interprets it quite differently. Her Area of Interest while in CNR was Land Use Planning with Emphasis on the Natural Sciences; while currently she is in a graduate program in Computer Science. Her overall satisfaction with CNR is expressed, as follows: *"I am one-hundred percent satisfied with the education I received as a CNR major."* With respect to 'flexibility' she comments, "[then] *Extremely* [important to me], *I was still searching around for my skills that were marketable and valued a broad approach to the study of environmental problems because I was 1) learning about environmental problems, with which I was deeply concerned, and still am; 2) getting a working knowledge of many disciplines...* [I wanted] *breadth -- ability to communicate with, and understand, other people and disciplines.* [flexibility-now] *Somewhat of a hindrance, knowing what I know now, (that's always easy!) I would have taken more computer science as an undergrad*

and thrown away some other courses I took...BUT THIS CAN HAPPEN IN ANY MAJOR... and in some majors, some probably look back and say, 'If only I had majored in such-and-such instead.'" How this woman got from Land Use Planning to Computer Science is a typical CNR evolution story. "[The Coordinator of the Resource Center] *showed me the first book I ever saw on relating computers to the Biological Sciences which gave me the idea I am currently researching."* Her response to, "Is the solution or broader understanding of environmental problems at all related to your current job and/or other activities?", fills in the rest of the story; "*Certainly, I feel that solar energy holds much promise for mankind to live in harmony with this planet. I am currently investigating the use of computer-simulation (simulation programing is my "bag") in the design of solar structures (e.g. be able to 'look at' the heat-flow of a proposed building at any point in time). A simulation of a proposed building's heat loss and gains would insure a properly designed building. I am also interested in simulation of population growth rates, and, of course, in relation to my area of interest, land-use growth rates."*

In these two illustrative cases the difference lies in assigning responsibility for lack of background in a late emerging area of interest which slowed progress in graduate school or profession. In the first case the bulk of the blame is placed on the program, and in the second case the woman accepts the responsibility in good spirits. Each of these patterns appear in a number of graduates' responses. The understanding, and willingness, to accept responsibility for one's education and the development of an appropriate course of study is the key to the productive use of the flexibility in CNR. When used with wisdom, which is the case for most people, the benefits reach far beyond simply fashioning one's own course of study as we have already described and documented. The above contrasting cases serve to remind us that individuals are different and perceive, understand, and react differently to the same objective phenomena. The strength of the flexibility in CNR is that it allows the CNR program to meet the needs of a wide range of unique individuals better than a more fixed program.

The most frequent reason cited for the flexibility in CNR being a hindrance later, was the difficulty some persons had in finding employment with their CNR degrees. Usually they indicated that their program had not been sufficiently specialized and job specific. Only about one-third of this group (approximately four percent (4%) of the total sample) felt it would be desirable to have more scientific-technical background. Some typical assessments from graduates will place this in its appropriate context. A woman (1976) who is now a graduate student at The Institute for Marine Studies, University of Washington (coastal zone management) states; "[then] *I think it attracted me to CNR in the first place.* [now] *The only problem with the flexibility was that I had little focus in defining my major. As a result, I had a very good general education which left me floundering somewhat in my job search."* A 1975 graduate who is a Residential Conservation Services Supervisor with Pacific Gas & Electric Company and very satisfied with her career, shares the following perspective; "*A hindrance only because I chose not to get a 'technical education'. Had I been required to take heavier' classes, it could have possibly allowed me to go into more technically oriented*

fields (I am still very pleased with my choices)." A 1973 graduate whose Area of Interest was Environmental Education, and who now works as a ski instructor, ski repairman, and landscaper, reports; *"I don't feel I could have had a better educational experience...However, the broad background approach does not seem to be accepted by employers."* Even this is not as simple as it appears, for several graduates mentioned that though their CNR education was a hindrance in initially getting a job, once they got a job it was an important asset, and helped them advance faster. For example, a 1975 graduate who has a unique job as a California State Park Ranger working with urban interpretation among disadvantaged youth in a cross-cultural setting, makes these comments about flexibility; "[now] *An asset in terms of personal growth and self-motivation. An asset in terms of personal advancement within jobs. A slight hindrance in terms of acceptance by traditional employment institutions."* Another 1975 graduate who is a systems analyst for a small business computer company, and very happy in his career replies; [flexibility] *It is an asset now; now that I have a career -- it was a great hindrance in initially finding a job..."*

Contradictions seem to abound even within the same agency, as the following two persons' interactions with the U.S. Forest Service exemplifies. Both are permanent employees of the U.S.F.S. One a woman (1976) who is a fisheries technician, valued the flexibility in CNR at the time, but now finds it a *"...hindrance because I indulged my search for knowledge in many fields without seriously doing some concentrated work in one area. Our world seems to be going in for those speciality jobs... I'm satisfied with my job but I can not advance beyond G.S. 5 or become a professional in the field unless I go back for* [more education]*...I really enjoyed my education at the time...All they do at work is tease me about my degree from Berkeley saying that I just took 'touchy-feely' courses! People serious in the environmental field have studied chemistry, physics, math... I tried going back to school last year and didn't like it at all."* The second person in sharp contrast, but also a woman (1974), is a G.S. 9 Biological Information Specialist with the U.S.F.S. With respect to flexibility at the time she remarks, *"the flexibility to change direction if needed was encouraging so a sense of 'wrong' direction was not perceived at graduation time.* [now-an asset] *I'm where I am now because of my ability to set my own objectives and assume responsibility. I am more independent and tend to assume more of a leadership or managing role in life.* [While in school] *my own initiative and interests guided me along a productive, useful course. I had a purpose, a direction and was not channeled and led along a pre-set course."* On her job, *My job with the U.S.F.S. consists of providing information to the public about Forest Service related environmental issues...My CNR background provides a needed combination with the more traditional U.S.F.S. background."*

Viewing these two evaluations together reveals the pattern that tends to distinguish those who benefit the most from CNR's flexibility, from those who believe they have been slowed down in their careers by it. Those who did , or had the potential, to take intentional personal responsibility for their educations and lives, were self-directed, and were internally motivated have done remarkable things with CNR's flexibility, that story after story throughout this report demonstrates, that they could have done in no other program at Berkeley, and for many of these at no other university anywhere.

While those who were not able, for whatever reason, to rise to this challenge generally value their education but have run into career difficulties later, for much the same reasons they did not make optimal use of the flexibility offered by CNR. This pattern is not true in every case but it does tend to dominate among individuals that encounter the kinds of problems we have been discussing. To some extent this small minority of CNR graduates who have had these kinds of difficulties could have been assisted more in the advising process. For others CNR may not have been the most appropriate major. But even this raises a paradox - for a very similar broad general education in Letters and Science would have left them equally, if not more, unemployable, though their expectations would probably have been different.

For a few graduates, about two to three percent, their CNR education made it difficult for them to get into the graduate school and program of their choice. While for a far larger percentage of CNR graduates their education greatly enhanced their ability to get into the graduate schools and programs of their choice (even the most competitive graduate programs of all - medical schools). A good example is a young man (1977) who is in a graduate program in Environmental Toxicology, emphasizing the effect of pesticides on organisms. He is one of the few graduates who was not too pleased with his education in CNR. He states; "[flexibility] *I wanted to think it was an asset then, but because of its flexibility I am now deficient in more solid course work.* [note, how in keeping with our earlier analysis, he blames the 'flexibility', rather than the choices he made within that flexibility] [flexibility-now] *An enormous hindrance, I feel that CNR should be more demanding...not enough true science courses...I had to make up course after course.* Interestingly, in spite of his general disatisfaction with CNR his internship was crucial in the development of his career; *"The internship has been invaluable. It allowed me to work intensely in the field, to gain experience and as a consequence I have gone completely into the area of pesticide toxicology."*

The trail to trying to understand the development of persons like the one just quoted traces back to earlier points in this report. He blames the flexibility of the program for his deficiences in more solid scientific course work, rather than the choices he made within that flexibility. In this instance the undergraduate Area of Interest was Biological Pest Control and his advisor was very competent in the area, as well as knowledgeable about environmental toxicology. That is, he had easy access to information, which he probably had, about the necessary courses essential to get into graduate school in the field he eventually chose. It follows from his above placement of blame, that he would recommend the program demand more (i.e. required hard science courses, etc.); rather than believing he should have demanded more of himself in a situation where he had choice. The placing of responsibility on the program for the insufficiencies in their education was fairly common among the small group that found CNR flexibility to be an unequivocal hindrance later. A variation is found in the comments of a 1975 graduate who is completing her PhD in Agricultural Resource Management at U.C. Davis. She is also the manager of the "Student Experimental Farm". Commenting on flexibility, she states; "[now] A

hindrance to some degree. I found graduate school difficult because I wasn't prepared. But I was able to study areas not available elsewhere... The idea is good. I did not have the self-discipline to gain the most from my education. Stronger advising and more required classes (science)." Perhaps the task for CNR with persons like this is to challenge them, and help them to build their self-discipline, rather than to impose it from without. Again, this has in fact been the case for large numbers of CNR graduates as indicated in their assessments throughout this report. Their comments make it clear that many do not come into CNR with the essential characteristics required to make the optimal use of flexibility well developed, but that the program enables them to develop self-discipline, responsibility, and focused motivation.

In concluding this section it will be helpful to reflect back on the basic purposes of the CNR major. The major is designed to provide a broad interdisciplinary background in environmental problems - social, economic, and political factors, as well as scientific and technical aspects. It is not designed to automatically prepare persons for specific careers any more than the 'academic disciplines' in Letters and Science are; though, relatively uniquely among broad programs in general education, CNR clearly does not prevent persons from preparing for a wide range of particular careers if they choose to. CNR students do in fact prepare themselves well for their later careers as Part IX "The Advanced Education, Careers, and Lives of CNR Graduates", so amply documents.

The guiding document in CNR, The Messenger Report - 1974, is unambiguous about the nature of the CNR major when it states; "It should be made clear that the major provides a generalist's background to conservation, but that it is not designed to prepare students for specialized resource management positions (p. 1)." Students in CNR are informed and aware of this.

Nevertheless, CNR does quite well in the area of career preparation.. CNR students ranked career preparation relatively low as a goal in the ARU-ASUC Survey (24th out of 40 programs); though still relatively high in an absolute sense (a mean of 4 on a 5 point scale). Significantly, CNR students ranked third among the fourty programs surveyed in the degree to which they felt their goal expectations for career preparation were met (see pp 14-21). This judgement stands the test of time when we examine both the careers and career satisfaction of CNR graduates relative to graduates from other programs on campus in a later section of this report.

The problem, to the extent it remains a problem, seems to reside in the expectations of a small, but significant, minority of CNR graduates who feel that even without an intentionally developed career orientated focus, their CNR education should have prepared them for a job. The fact that it didn't do this too well leads some persons to fault the program, rather than adopting a more balanced perspective that incorporates their own failures to take sufficient responsibility and initiative, as well as the program's failure to provide its share of the necessary ingredients for their success.

In an instructive contrast, Letters and Science graduates, who often develop less academic breadth than many CNR graduates, tend not to expect their academic program to prepare them for specific careers. When L&S graduates do not get jobs in their fields, and a large percentage of them don't, they tend not to blame their undergraduate program in the same way a number of CNR graduates do.

C. Overall and comparative impact of "flexibility". A fairly Comprehensive analysis of the impact of flexibility on the education, careers, and lives of CNR students and graduates has been presented. CNR students felt they were more able to meet their specialized educational interests than students in any other program surveyed. The consequences of "flexibility" in concert with other aspects of the major, in the later careers and lives of CNR graduates as a group, is revealing; especially when CNR graduates are compared with U.C. graduates in general. Part IX, "The Advanced Education, Careers, and Lives of CNR Graduates", will present detailed data and analysis. We will just highlight the significant pieces of that data for our present considerations.

1. In retrospect - Over eighty percent (80%) of CNR's graduates, compared to about fifty percent (50%) of all U.C. graduates, would do their undergraduate education essentially the same if they had it to do over again (see question #7, page 23). Ninety percent (90%) of CNR's graduates, compared to seventy-eight percent (78%) of all U.C. graduates, were satisfied with their undergraduate education from their current perspectives (see "overall satisfaction", pages 9-10 and qualifying footnote). These data provide strong confirmation of the effectiveness of "flexibility" in fashioning an education that is both appropriate and satisfying at the time, and over the years following graduation.

2. Advanced education - fourty-five percent (45%) of CNR graduates, compared to fifty-eight percent (58%) of all U.C. graduates were enrolled in, or had completed, advanced educational programs. CNR's percentage is essentially the same as that for other comparable professional school programs.

3. Knowledge and skills - Ninety-six percent (96%) of CNR's graduates, compared to seventy-five percent (75%) of all U.C. graduates reported that the knowledge and skills they acquired as undergraduates were valuable in their work or advanced studies.

4. Satisfaction in career or developing career - Eighty-three percent (83%) of CNR's graduates, compared to sixty-one to sixty-three percent (61%-63%) of all U.C. graduates were satisfied with their careers/work or developing careers (the questions asked the two groups were slightly different - see page 22).

"Flexibility" is a critical component of the whole CNR program which yielded these outstanding results. The advantages of flexibility

have been shown to far outweigh any residual disadvantages in both the short and the long run.

In conclusion CNR's concerted efforts to meet its students as individuals and to help them progressively shape and fulfill their unique educational needs through a flexible program has proven to be very successful when judged against significant criteria. It has been successful both while persons are in the program and after graduation, in an absolute sense, and in comparison to other campus programs. This is not meant to imply that improvement in the use of flexibility in CNR can not, and should not, be sought. The data indicates that the program has been continually improving in this and other areas, and directions for added improvement have been pointed out in this section. Thus, as it has done over the years, continued dialogue between students, faculty, and staff in the program can and will yield further improvement.

3. Courses and Teaching

> "In so far as I have learned to listen to people and to honor and respect them as individuals, I have been a good teacher. When I have failed to do this my teaching has failed."
>
> Myles Horton[14]

This evaluation of courses, teaching, and faculty is from two perspectives: One, from students while they are still undergraduates in their programs, and two, from graduates with their view tempered by later experiences. Thus, the emphasis is on how students and graduates judge the impact of courses, teaching, and faculty on their educations, careers, and lives. This is one of the most, if not the most, important methods of evaluating courses and teaching. Students are not only the 'consumers' of education, but it is against their subsequent lives and careers that the effectiveness of courses and teaching must by ultimately judged.

This section consists of three parts: A) Regular Courses and Teaching; B) CNR Required Core Courses; C) Independent Studies, including Internships.

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14. *Myles Horton was the founder of Highlander Research and Education Center in 1932 and for many years its director. Highlander is perhaps the most important adult education center in the United States, and Myles Horton is one of our most distinguished 20th century educators. See Frank Adams, Unearthing the Seeds of Fire - The Idea of Highlander, John F. Blair, Publisher: Winston-Salem, North Carolina, 1975.*

A. Regular Courses and Teaching

Students or graduates or both were asked the following questions in one or more of the questionnaire surveys drawn on in this study (see appendix A for a description of surveys). They assess various significant aspects of courses, teaching, and the teaching-learning process.

1- The coursework in the program is [was] interesting and challenging.

course work challenging: Means CNR and comparison groups

CNR-ARU 79	4.14	Life Sciences-ARU(18)...	3.88
CNR-Follow-Up....	4.20	All programs-ARU(40)....	3.81
Rank CNR	4th	(range.. 2.96 - 4.46)	

2- Teaching by faculty in this program is challenging, of high quality, and increases my interest in subject matter.

teaching of high quality: Means CNR and comparison groups

CNR-ARU 79	4.16	Social Sciences-ARU(14).	3.64
Rank-CNR	3rd	(range.. 2.92 - 4.35)	

3- To what extent have faculty and coursework at UCB increased your motivation to pursue your own intellectual interests, apart from University classes, grades, degrees, etc.?

pursue intellectual interests independently: Means CNR and comparisons

CNR-ARU 79.....3.91		Social Sciences-ARU(14)..3.55	
Rank-CNR.....	3rd	(range 3.08 - 3.97)	

4- To what extent have faculty and coursework at UCB increased your motivation to pursue ideas presented in class?

pursue ideas presented in class: Means CNR and comparison groups

CNR-ARU 79.....	3.97	Social Sciences-ARU(14)..	3.45
Rank-CNR.....	2nd	(range 2.93 - 4.08)	

5- There are enough courses available in this program which explore the contributions of nondominant "schools of thought"(e.g. radical, conservative, futurist, traditionalists, feminist, third world, etc.)

nondominant schools of thought: Means CNR and comparison groups

CNR-ARU 79.....	4.38	Life Sciences-ARU(18)...	2.64
Rank-CNR.....	2nd	All programs-ARU(40)....	2.87
		(range 1.81 - 4.48)	

6- Faculty in this program [in CNR] show enough concern about social issues in teaching their subjects.

concern for social issues in subjects: Means CNR and comparisons

CNR-ARU 79.....	4.55	Life Sciences-ARU(18)...	3.27
CNR-Follow-Up....	4.69	All Programs-ARU(40)....	3.33
Rank-CNR.....	2nd	(range 2.13 - 4.63)	

7- Communication between faculty and students in this program [in CNR] is [was] open and fairly extensive.

communication with students: Means CNR and comparison groups

CNR-ARU 79.....	4.33	Life Sciences-ARU(18)...	3.27
CNR-Follow-Up....	4.46	All Programs-ARU(40)....	3.28
Rank-CNR.....	2nd	(range 2.50 - 4.52)	

8- Most of the faculty in this program are receptive to student input on class structure and content.

input class structure and content: Means CNR and comparison groups

CNR-ARU 79.....	3.86	Life Sciences-ARU(18)...	3.23
Rank-CNR.....	2nd	All Programs-ARU(40)....	3.20
		(range 2.30 - 4.00)	

9- About how many times did you have a discussion outside of the classroom with any professor, apart from study list advising, in the last three months (excluding vacation periods)?

discussions with faculty: Means CNR and comparison groups

CNR-ARU 79.....	3.76	Social Sciences-ARU(14)..	3.01
Rank-CNR.....	2nd	(range 1.94 - 4.03)	

scale:(1)0; (2)1-2; (3)3-4; (4)5-6; (5)7 or more times

10- About how many faculty KNOW YOU by name or sight?

faculty know you: Means CNR and comparison groups

CNR-ARU 79.....	3.44	Social Sciences-ARU(14)..	2.77
Rank-CNR.....	1st	(range 2.00 - 3.44)	

scale:(1)0; (2)1; (3) 2; (4)3; (5) 4 or more faculty

11- At least one professor knows me or my work well enough to write me a good recommendation for graduate school or a job.

know well enough write recommendation: Means CNR and comparisons

CNR-ARU 79.....	3.47	Life Sciences-ARU(18)...	2.87
Rank CNR.....	3rd	All Programs-ARU(40)....	3.00
		(range 1.90 - 4.04)	

Discussion. Regular Courses and Teaching.

CNR's average rank across all of these questions placed it first among all fourty programs surveyed in the overall rating of the quality of courses, teaching, and faculty. Thus, students' assessments of the CNR program on these dimensions are more uniformly high than any other surveyed program on campus. In reviewing the data we once again find that CNR is rated exceptionally well, and that the judgements made by students while they are in the program are sustained by graduates from the perspective of their current positions in life. The educational effectiveness of the CNR faculty stands out as absolutely and comparatively high. CNR students appear to select good teachers and courses, in their judgement, outside of the CRS department as well.

CNR students view their course work as interesting and challenging, and this assessment is confirmed by graduates (CNR ranked 4th

among programs surveyed, see question #1). The quality of teaching in students' courses and among CNR faculty is rated very high (CNR ranked 3rd among programs surveyed, see question #2). CNR faculty were especially well rated in their ability to stimulate students' motivation to pursue intellectual interests both within classes and outside of the context of the courses themselves (CNR ranked 2nd and 3rd, see questions #3 and #4). This indicates that students, in their judgement, use their freedom of choice wisely and choose challenging courses taught by good teachers.

CNR students believe that they have been able to gain exposure to a wide range of 'schools of thought' and points of view within their program (rank CNR 2nd, see question #5). Some have maintained that programs like CNR are too one sided and that students do not gain a balanced perspective. This data, along with the fact that students in CNR take most of their courses outside of the CRS department, documents that CNR students are exposed in more depth and breadth to diverse 'schools of thought' than students in virtually any other program on campus. The consideration of social issues and the assumption of social responsibility is very important to most CNR students (see pages 14-21). They indicate that they are satisfied with the degree of concern faculty show in class for the social issues that relate to their courses (CNR ranked 2nd, see question #6).

The quality and degree of communication between CNR faculty and students is excellent and extensive. This evaluation stands the test of time, as graduates rate this area as highly as undergraduates (CNR ranks 2nd, see questions #7 and #8). CNR stands near the top in terms of the number of faculty students know, and the frequency of productive discussions with faculty (CNR ranked 1st and 2nd, see questions #10 and #9). Faculty in CNR obviously care about students and are open and available to them outside of class to a degree seldom equaled in other programs.

In light of the fact that faculty rarely attend each other's classes, let alone sit through a whole course, students' and graduates' evaluations are not only the most relevant, but the only ones we have based on substantial and appropriate evidence - what actually transpires in the classroom. That is, courses and teaching are for students, and hence, students are ultimately the best judges of how well a teacher has taught -- for it is they who have learned or not learned, been inspired or bored, led to new insights and syntheses or unaffected. It is only students and their later accomplishments that can reflect back over time and establish the long term effects of an educational experience. It must be remembered that the principal purpose of courses and teaching are their long term contributions to the careers and lives of the people who take them and to the society at large. In this context it is important to note that students' judgements at the time they are taking courses tend to closely parallel graduates' later judgements. That is, what is judged to be effective at the time, tends to be

judged effective in the long run as well. There is little evidence in this, or any other study, to support the oft heard statement, "You may not appreciate it now, but you will some day."; given to students who are critical. Though this may occasionally be true in specific instances, it is simply not the case in general.

In conclusion, it is clear that CNR faculty meet students' needs for quality teaching, education, and time to discuss intellectual interests to a greater degree than any other program among those surveyed. It is not an unreasonable inference that this holds for all undergraduate programs on campus.

B. Required CNR Courses

A small set of relatively unique courses form the core of the CNR major. They are, CNR-49/90, the Introductory Seminar to education in CNR; IDS-10A,B,C, a broad interdisciplinary survey of environmental issues; and CNR-149, a Senior Seminar designed as a synthesizing experience for graduating seniors. The overall evaluations of courses, teaching, and faculty in the previous section apply to these courses as well, in that the questions did not exclude these courses. However, it is important to look at these courses individually too.

1. Interdisciplinary Studies 10; A-Ecosystems, Their Maintenance and Disruption; B-Global Environmental Problems; C-The San Francisco Bay Area. This course provides a broad interdisciplinary survey of major environmental issues. A wide variety of topics are covered from diverse perspectives relying heavily on guest speakers, accompanied by small discussion sections. Thus, the student gains a broad base of knowledge about current environmental issues and is exposed to many different points of view about them. Optional project sections (IDS-10L,M,N) are offered concurrently for those students who want to pursue various problems and solutions in greater depth. These often involve substantial work in the field or community.

CNR students responding to the 1980-1981 Survey were asked: Did you value the IDS-10 series? CNR graduates in the Follow-Up Study (1980) were asked: There are several courses that are specifically CNR courses: [listed]...Were any of these especially important to you? Briefly describe how and why.

Value of IDS-10 series

CNR 1980-1981 Mean 4.12

(5)of great value 40%; (4)40%; (3)14%; (2)5%; (1)of no value 1%

CNR Follow-Up* Mean 4.47 (adjusted to a 5 point scale)

(3)of high value 73%; (2)of moderate value 22%; (1)of low value 5%

*in categorizing responses CNR content courses were lumped together (IDS-10, CRS-110 Ecosystemology, and IDS-120 Environmental Education).

IDS-10 is given high marks by most of those who take it. The mean for courses campus-wide on a similar question is 3.81 (see question #1, page 56), while the mean for IDS-10 is 4.16 (i.e. 41% of those taking IDS-10 found it to be of great value, compared to 22% for courses campus-wide). In keeping with the pattern throughout this report the judgements and comments of graduates parallel those of current students.

The explicit goals of IDS-10 are well realized for a large majority of persons. IDS-10 has not only served its purpose as a broad introduction to environmental issues, but has had a profound impact on the education and lives of a substantial portion of those who have taken it. The following evaluations from current students and graduates (year of graduation in parentheses) will give this statement substance and flavor: *"IDS-10A,B,C, are absolutely essential to understanding the dynamics that exist beyween economics and politics; and environmental biology, ecology and ecosystems ('77)." "The best series on campus." "I feel the whole world has opened up to me." "IDS-10 is the greatest thing education-wise, that has ever happened to me...my scope increased...I came away with a more integrated viewpoint." "My first exposure to such high quality speakers and guests. These concerned people really made me stop and take a real look at the world. It stands out as the best course I had in college ('77)." "This course moved me to enter CNR, and I see others affected by it all the time."* IDS-10 appears to achieve with many students that elusive educational goal of fully engaging the whole person in the pursuit of knowledge and understanding - the kind of engagement that changes people's lives in the directions advocated by the University's most fundamental purpose - a commitment to working to make a better world. The course leads many students to select CNR as a major (the course with its large enrollment attracts many lower-division students from every sector of campus); and helps many others to establish and begin to refine their specific Areas of Interest within CNR. The course is well designed to meet students' legitimate needs at this stage of their actual educational development.

Persons, for the most part, saw IDS-10 as an objective presentation. Comments from those who have taken the course will speak to this: *...allows students to develop their own analysis" "...very enlightening, offering very objective (and therefore alternative) information and points of view ('76)." "...Its objective setting allows students to become subjective."* Only a few students remarked that the 'environmentalist' perspective was too dominant.

IDS-10, like most general survey courses on campus, has small discussion section meetings each week in addition to large lecture sessions. Bringing together small groups of students with knowledgeable leaders has been a critical and valued component of the course. Not simply in the academic sense, but also in bringing together students to think about and discuss issues with each other. Many students commented that the opportunity to enter into dialogue with their peers in the company of knowledgeable guidance was

otherwise generally lacking in their educational experience at Berkeley. IDS-10 was "...*a good vehicle in encouraging one to explore, research, discuss, and experience in groups ('75).*"

A number of students expressed the view that two quarters of IDS-10 were "great", but that three was too much. This feeling accounts for the substantial percentage of students who substitute another course for the third quarter of IDS-10. The availability of this option is fully justified on a number of counts, and is another example of CNR's flexibility in meeting the diverse needs of its varied student body. A few students who greatly valued their IDS-10 experience resented the fact that some of their fellow class members, who were rarely other CNR students, considered the course a "mick". Though in the past it has been relatively easy to get a passing grade in IDS-10, this obviously does not imply that the course is not an excellent one; but merely that it could be taken advantage of a little more easily than courses with lower grade curves (i.e. courses giving smaller percentages of passing and high grades).

Though valuing the course, a significant portion of students found it both overwhelming and depressing due to the number and magnitude of environmental problems, and the relatively lighter emphasis on solutions. The majority, however, saw it differently. For example, "[IDS-10] *helped me learn where there's smoke there's fire; i.e. for every problem there's a reason and thus a solution.*" Such trade-offs (e.g. between covering a wide range of problems vs. covering fewer problems and examining solutions in greater detail) must always be made in broad survey courses with real time constraints. Finding optimal balances between the many factors is an on-going challenge, and no matter what, one can never satisfy everybody. One good solution to being overwhelmed by the problems is the focus on in-depth analysis and solutions of one problem found in the optional project sections (IDS-10L,M,N). A student comments; ...[project sections]...*are the 'critical missing link' to the series - bringing a solution (at least attempted) to the many problems.*" Perhaps CNR students should be more strongly encouraged to take project sections along with IDS-10A,B,C,.

The impact and value of the IDS-10 series is demonstrably related to the academic background and understanding people bring to the class. Thus, a significant number of students rightfully felt that the course lacked sufficient depth given their background and current needs, and emphasized their desire for a more probing course. This should not be confused with the level of ability and motivation of students, for it is clearly anchored in background preparation, not potential. The following evaluation of IDS-10 is typical of many CNR graduates who have embarked on distinguished careers. It comes from a graduate ('76) who has completed a Master's degree in Public Health at one of the nation's leading institutions, John Hopkins University, and is currently a fourth year medical student focusing on environmental health at the University of California Medical School, San Francisco. She states; "...[The IDS-10 series was an]... *incredibly good synthesis of biological, social and physical sciences and how*

they bear on environmental issues. Independent projects in 10LMN helped me explore areas of interest. I still use some of the articles in the syllabi... which were well put together. [The] reading alone made the courses worthwhile, and the lectures were memorable and very inspiring". An appropriate solution to this real distinction between students, with respect to background and needs, would be to offer an advanced 100 level course as an alternative to IDS-10. Students would then have two options to choose from to better match their background and needs. CNR has just such a course on the books to serve this purpose, but does not yet have the resources to staff it. Clearly both options should by available and staffed.

In conclusion, IDS-10 functions as a basic and essential introduction to the range of environmental issues and disciplines encompassed by the CNR major. The data indicates that it fulfills this function exceptionally well.

2. Introduction to Conservation of Natural Resources-Seminar CNR 49/90. (Formerly CNR 49 required of all entering Freshman and Sophomores, and recommended for upper-division transfers; and now CNR 90 which is required of all entering students). This course is intended to facilitate the laying of the underlying warp of the CNR program through which the weft, or content, can be woven in the pattern of each individual's "Area of Interest". It introduces people to the CNR community and its philosophy. It helps students clarify their educational goals and needs, and to develop their program of study. Students are further introduced to CNR, campus, and community resources. CNR 90, with increased units, added a component directed at problem solving skills for addressing environmental problems. A student describes CNR 49 as follows:

> *"For me, the primary focus of the CNR 49 experience is responsibility--the responsibility for one's educational process which the individualized nature of the major demands, and the responsibility for our own actions and life styles which must be recognized for an effective commitment to the conservation of natural resources. The first of those objectives is apparent from the structure of the course: academic planning, educational resource exploration, and exposure to alternative educational perspectives. The second objective, personal responsibility and commitment to the eventual realization of natural resource conservation, is a concept which I think is unique to this major..."* (CNR Handbook 1978/80)

A summary of people's evaluations:

1. Graduates were asked; Were any of these [CNR 49,CNR 149] especially important to you? Briefly describe how and why?

2. Undergraduates in the 1976 Student Initiated Questionnaire were asked; Do you feel that courses similar to CNR 49 and CNR 149 dealing with the CNR philosophy are pertinent to your CNR program?

3. Undergraduates in the 1980-1981 Survey were asked; Did you find CNR 49 (new CNR 90), the Introductory Seminar, worthwhile?

Each of these questions was seeking slightly different kinds of information, but are roughly comparable.

Value of CNR 49, CNR 90, CNR 149

1. CNR-Follow-Up — Mean 4.35 (adjusted to 5 point scale)

   (3)of high value 71%; (2)of moderate value 19%; (1)low value 10%

2. Student Survey (1976) — Mean 4.42 (adjusted to 5 point scale)

   (3)yes 82%; (2)maybe 1% (1)no 17%

3. CNR 1980-1981 — Mean 3.72 (CNR 49/90: N=57*)

   (5)yes, extremely worthwhile 23%; (4)37%; (3)30%; (2)10%; (1)no, not at all 0%

   -CNR 80-81 (1-3 quart.) Mean 3.53 (CNR 90: N=21)**

   -CNR 80-81 (4+ quart.) Mean 4.05 (CNR 49: N=36)**

   (5)yes, extremely worthwhile 33%; (4)43%; (3)19%; (2)5%; (1)no, not at all 0%

*Only 54% of the sample had taken CNR 49/90. Junior transfers were not required to take CNR 49, until replaced by CNR 90 in 1980.

**Students who had been in CNR between 1 and 3 quarters could only have taken CNR 90; those who had been in CNR 4 or more quarters had taken CNR 49, with a few exceptions.

N.B. *Average rating for all courses, across ALL PROGRAMS (ARU-40) for roughly comparable questions was: Mean = 3.81*

The Introductory Seminar is frequently one of the most critical courses in a student's program, for it has the task of helping to shape direction, tone, and values. It has been, and remains, one of the most difficult and challenging of all courses to conceptualize and organize successfully at the level of practice, though several faculty have. Because of its purpose the Introductory Seminar, to a greater degree than other courses, is dependent on a sensitive awareness of where students are, individually and collectively, in their educational and personal development. The success of the course requires developing good dialogical relationships between faculty, students, and the 'student aides' who assist in the course. To pitch the class at students as an undifferentiated group of persons, which is fairly typical of lecture-type classes, would be to make CNR 49/90 disfunctional. Students and faculty see classes like CNR 49/90 and CNR 149 as important and essential to their program. For example, in the 1976 Student Initiated Survey eighty-seven (87%) of those who had taken CNR 49 felt that such courses were pertinent

to their programs, and seventy-nine (79%) of those who hadn't taken CNR 49 (but would eventually take CNR 149) felt similarly. CNR graduates reported that CNR 49 and CNR 149 had been very important components of their education.

One of the key features of CNR 49/90 is the integrated use of advanced CNR undergraduates as 'student aides' in the course. They function as experienced peers who are uniquely suited to draw others into the meaning, value, and activities of the CNR major. They also serve the traditional role of 'readers' of student assignments. The 'student aides' serve as a good bridge to bring new students fully into the many educational activities and possibilities within the CNR community - a way of building continuity. The contributions of 'student aides' has been universally praised by faculty and students alike. These experiences have also proved to be excellent and unique educational opportunities for the 'student aides' as well, many of whom are planning careers in, or closely related to, education.

CNR 49/90 serves its purpose of bringing new students into a 'community of learners' quite well. Students express this clearly in their evaluations. For example: *"Allows the student early in his or her education, to develop relationships with other students and faculty sharing the same interests and objectives. It allows the student to become active, feel accepted in the social spheres of the school - overcoming the barrier of alienation in the large University setting." "Made me feel a part of a community ('74)." "It gave me a feeling of comradery...structure was a relief from typical Berkeley classes."* CNR 49/90 moves students into participating in their learning and developing a responsible, integrated approach to their education and life plans. Students reflect as follows: *"It was learning a different approach. But very valuable in that I had to participate." "I found it important to come to terms with the interrelationships of personal life with political objectives and career possibilities."* CNR 49/90 allows new CNR students to address their fundamental educational concerns in a manner that is virtually unique on the Berkeley campus.

We would be seriously remiss in our educational responsibilities if we underestimated young persons' needs to systematically examine their motivations, interests, and possible life directions in a supportive and focused environment. CNR 49/90 provides an environment and structure where students are asked to embark on, or continue, the process of systematic and reflective integration of course work, field work, and life plans. Certainly, CNR 49/90 can not, and should not, be the beginning and end of this process; but it can initiate, or facilitate the process by providing structure, direction, and focused time. A large portion of students, and this is characteristic of undergraduates in general, have never before examined their education and life plans in a systematic, focused, and sustained way, especially in a context where relevant questions and issues can be raised and sustained dialogue encouraged. Few would argue that this is not one of the most complex, difficult, and important decisions one makes in life. To integrate this process into many aspects of the CNR program rather than leaving it to ancillary

services like career guidance and counseling centers that are distant from the program itself, has proved invaluable for CNR students.

Two, of many, indications of the success of this strategy are: 1) the relatively small percentage of CNR graduates who indicated that they would substantially alter their undergraduate education if they had it to do over again, compared to UC graduates in general (CNR graduates-20%; UC graduates in general-50%: see page 23); and 2) the relatively high level of career satisfaction of CNR graduates compared to UC graduates in general (CNR graduates-83% satisfied; UC graduates in general-approximately 65% satisfied: see page 22).

Even allowing for somewhat different foci in the questions asked, it is fairly clear, and student comments confirm this, that CNR 90 (it has only been offered three times) is less successful than the old CNR 49 in achieving its stated purposes. The majority of students responding to the 1980-1981 CNR Questionnaire had taken CNR 90, rather than CNR 49. The mean value of CNR 90, mean = 3.53, was still within the range of that for typical courses on campus; while the mean rating given by students who had been in the program four or more quarters was 4.05, presumably virtually all of these students had taken CNR 49, rather than CNR 90. An examination of the difference between CNR 49 and CNR 90 will provide some clarity to the challenges surrounding the Introductory Seminar.

A few evaluative statements from students will bring substantive flavor to our analysis; *"I know CNR 90 is meant to get people thinking and draw them into the action in CNR, but somehow in our class that did not work. Many people ended up alienated, or if they were insensitive, no different at all." "I took CNR 49 and it helped me make my decision but didn't rush it* [to enter CNR and decide on a direction]. *I hear CNR 90 was not good with picky assignments. The class should only involve deciding on a direction in CNR, not more units. A friend of mine wanting to join CNR, was turned off by CNR 90."* The problems encountered in CNR 90, apart from instructor idiosyncrasies, stem from several factors: 1) being required of all entering CNR students its enrollment shot way up (from about 45 in CNR 49 to 90 before enrollment was closed in CNR 90); 2) there was resentment among some upper-division students over its being a requirement, as the needs of lower-division students were significantly different from the needs of upper-division students; 3) the addition of the problem solving component was not well integrated into the traditional purposes of the course and, thus, created some confusion. There also appeared to be some overlap between this component of CNR 90 and the project sections in IDS 10; 4) the course is still in a developmental stage.

Having learned from their mistakes, CNR is, in its traditional fashion, through systematic dialogue between faculty and students, re-thinking the course. Substantial changes in the Spring 1981 offering promise to return it to its original position of strength. Namely, limiting it to lower-division students and an enrollment of

fourty-five; and separating its traditional function (CNR 49) from the problem solving component by having separate meetings for each. Experience and the data suggests that CNR 90 should return to the original purposes of CNR 49 and involve fewer hours. Though it is believed that an Introductory Seminar could play an important role in the education of Junior transfers, their needs are sufficiently divergent that a separate section of the seminar needs to be developed for them. CNR had such a course but lacked the resources to adequately staff it.

In conclusion, CNR 49 was shown to have played a unique, important and successful role in the CNR program. Its successor CNR 90 appears to have some conceptual and practical problems, exacerbated by scarce resources, but is in the process of being restructured to better meet the goals of the Introductory Seminar. Hopefully in time it will improve on the old CNR 49 as well.

3. Senior Seminar in Conservation of Natural Resources - CNR 149

"The life which is unexamined is not worth living."
-Socrates-

"Most people do not accumulate a body of experience. Most people go through life undergoing a series of happenings undigested. Happenings become experiences when they are digested, when they are reflected on, related to general patterns, and synthesized."
-Saul Alinsky-

The Senior Seminar is usually taken during a person's final quarter before graduation. It is a structured time for synthesis. Like the Introductory Seminar it focuses on the often neglected interface between courses, career, and life. The Senior Seminar provides a significant pause for people to take stock at a critical point in their lives. For the majority it will be the first time since early childhood that their regular occupation will not be school. There is often great uncertainty and anxiety - people are asking themselves, "What lies beyond?" Not an easy question in these times of mounting crises and uncertainties. The Senior Seminar is intended as a capstone to a CNR education. Most students look forward to the Senior Seminar, often with 'great expectations'. They are expected to complete a synthesis of the diverse strands of their education and achieve a coherent sense of the whole. Similarly, they are expected to project it forward in terms of its potential for advanced schooling, careers, and life. Though this is often relatively easy with respect to 'form', the challenge of 'essence' - how to gain meaning in one's work and life is on-going and never easy. Thus, the integrative and reflective nature of CNR 149 is an attempt to meet important educational needs. This, too, is a unique course on the Berkeley campus.

The class meets once a week, usually in the evening after a shared potluck dinner, rotated among the homes of the class members. Students are required to present a seminar that in some manner reflects the coherence of their Area of Interest, and to prepare a written 'Senior Synthesis' which addresses the question: What is my situation - Where have I been? Where am I now? and Where am I going?

The questionnaire data that bears on CNR 149 can be found in the table on page sixty-four. The narrative data from graduates will build a sense of the actual impact of this highly rated educational experience: "[CNR 149] *Allowed me to summarize my LIFE, values and attitudes before 'going out on my own' ('73).*" "...[the faculty member teaching CNR 149]...*was a great inspiration and offered encouragement to all of us concerning post-graduation ('76).*" "[CNR 149 was] *important for goal setting and career evaluation...[it] made me think about what I wanted to do and where I was going ('74).*" "[CNR 149 was] *one of the most important processes for me - I gained a sense of confidence in myself that has continued to grow "'75).*" "*A valuable class - I learned to evaluate my experience in the CNR program and learn what my peers had gotten out of their experience in CNR ('77).*"

We have noted that the Senior Seminar is highly valued by the overwhelming majority of CNR graduates. This coupled with the representative sample of narrative evaluations which indicate why graduates valued their CNR 149 experience, demonstrates that the Senior Seminar generally achieves its stated purposes. The data with respect to career satisfaction of CNR graduates in comparison with that of UC graduates in general (see page 22) affirms the cumulative effectiveness of the CNR program and the focusing value of the Senior Seminar as a part of the whole.

Like the Introductory Seminar, the Senior Seminar is a difficult, but usually rewarding, challenge for faculty and students alike. Since it is interactive and in significant part dependent on dialogue, its degree of success varies as a function of its membership, including the faculty person leading the seminar. That it is generally judged successful is a tribute to the quality of faculty and students in the CNR program.

In conclusion, the Senior Seminar generally serves as an important and successful capstone to the CNR educational program. Graduates affirm this from the perspective of their experiences since graduation.

C. Independent Studies and Internships (CNR 99/199-individual independent study; CNR 198-supervised independent group study; CNR 197-field study; CNR 180-internship)

"Independent" in this context means the freedom and flexibility to craft unique educational experiences to meet specific individual and small group needs as they emerge from the logic of people's

educational development. Some of these courses can be used to pursue intellectual interests not covered in formal courses (CNR 99, CNR 199, and CNR 198); others to engage in 'praxis' (CNR 198, CNR 197); yet others for field experiences with a minimum of analytic work (CNR 197). Internships are a sustained single involvement for an entire quarter, and will be considered separately at the end of this section. Within CNR these courses are the primary avenue for pursuing praxis - the simultaneous learning of theory and practice. Though these courses are the major vehicles for integrating reflected upon practical experience into a student's program, several courses closely associated with CNR have field and community components that are either an integral part of the course or optional additional components (e.g. IDS 120 Environmental Education, and the IDS 10 series' project sections IDS 10L,M,N).

CNR students, faculty, and staff use these courses extensively to meet individual goals and the goals of the CNR program (see 'selected educational goals', pages 13-17). The following table gives a general indication of the extent to which CNR students exercise these options. It is a substantial underestimate because CNR students enroll in these courses under the sponsorship of faculty in many departments across campus, depending upon their specific interests.

Enrollment in Independent Studies for the Academic year 1979-1980

	F	W	Sp	Su	TOT
CNR 99	1	0	3	0	4 *,**
CNR 199	13	13	33	1	60 *,**
CNR 198	17	49	52	0	118 *,***
CNR 197	16	28	20	1	65 *
CNR 180	12	14	7	14	47

* *A number of CNR students take 99's, 199's, 198's, and 197's in other departments as a function of the individual professors and projects that they want to get involved with, thus figures are low.*

** *Over 15 different faculty sponsored these 99's and 199's. Rarely more than 2 a quarter per faculty.*

*** *There were 15 sections of 198's, with an average of 8 students per section (range 3-15), sponsored by 8 different faculty members.*

Questionnaire Data on Independent Studies

1. Comparison of CNR with other campus programs: Undergraduates and graduates were asked:

> There was enough field work, internships, groups, or other experimental course offerings in this program [in CNR] and credit was readily available for appropriate volunteer experience.

Independent Study Options:	Means CNR and comparison groups		
CNR-ARU 79.....	4.62	Life Sciences-ARU(18)...	3.25
CNR-Follow-Up....	4.17	All Programs-ARU(40)....	2.95
Rank-CNR.....	1st	(range 2.13 - 4.62)	

Discussion. CNR students, almost to a person, strongly agreed that there were enough independent study options in CNR. This judgement was sustained by CNR graduates. CNR was well ahead of the second ranked program which had a mean of 3.88. It is interesting to note that over 25% of the respondents in over one-third of the programs checked "not applicable" or "no information" for this question, indicating that they were not even aware of the options generally available for undergraduates at Berkeley. In sharp contrast to CNR, the average student on campus feels that he or she has far too few "independent study" possibilities.

2. How do CNR students and graduates view Independent Study - Community involvement?

A. Students in the 1980-1981 Survey were asked:

CNR encourages involvement in the community (practical experience) through field studies, internships and other individual and group projects.

-Do you believe this is an important emphasis for one's education?

Mean = 4.82 :(5)yes, very important 85%; (4)12%; (3)3%; (2)0%; (1)No 0%

-If you have worked in the community as part of your CNR program has it been of value to you?

Mean = 4.50: (5)yes, of great value 72%; (4)17%; (3)6%; (2)0%; (1)No 5%

-Do you plan to include community involvement in your program?

YES--69%; MAYBE--28%; NO-- 3%

-Do you plan to do an internship during your education in CNR?

YES--54% MAYBE--30%; NO--16%

B. CNR graduates in the Follow-Up Study were asked for narrative responses to the following questions:

CNR encourages involvement in the community through field studies, internships, and other individual or group involvements.

-Did you take advantage of these opportunities?

88% of CNR graduates responded YES.

78% took either 199's, 198's or 197's

65% took an internship. * *The class of '74 was the first group that was able to take full advantage of the internship program. This percentage is for the classes graduating from 1974 to 1979.*

-Of what value have they been since graduation (helping career/work choices, contacts for jobs, etc.).

99% of CNR graduates found their Independent Studies to be of value to them after graduation. Most found them extremely valuable.

100% of CNR graduates found their internships to be of either great value(89%) or moderate value(11%). Mean = 4.82.

C. CNR students responding to the 1976 Student Initiated Questionaire were asked:

-Do you know about the 15-unit internship program?

YES--80%; NO--20%

-If so are you planning an internship as part of your academic plan?*

YES--35% (3% completed, 32% planning to)

MAYBE--21%

NO---24%

* *These percentages are based on the total sample.*

Several strong conclusions emerge from this data:

-CNR students share the program's goal of substantial practical experience and community involvement.

-The CNR program provides adequate opportunities and resources to meet these goals.

-A large proportion of current students either have, or plan to take advantage of these opportunities. A large percentage of graduates did, in fact, take advantage of these possibilities.

-CNR students while still in the program found these experiences of great value; and graduates found them to be of exceptional value in their later careers and lives.

The word that best describes CNR students' and graduates' responses to these experiences is "enthusiastic", as the accompanying evaluation and analysis reveals in detail. They are seen as one of the most critically important components of the program, and as one of the central means by which several of the program's goals can be fully realized - flexibility, practical experience, community involvement, social responsibility, and career development.

In examining their community experience current students emphasize how important it was in learning to apply knowledge as well as in helping them to shape their academic program. Some representative comments in this vein follow; *My [community work] added a new dimension to my education and changed my perspective, as a result I modified my area of interest. The experience helped me understand what type of disciplines I should incorporate into my area of interest, which I had not considered up until that time."* "*Application of knowledge is essential - beginning this application is especially valuable while being in school because it gives us the opportunity to see where the "gaps" may be and to take courses in those areas and receive additional support and guidance."* Others speak of the meaning these experiences have brought to their courses on campus; *"I think it is extremely valuable to work in the community to synthesize that learning. It has been the most valuable aspect of my education, it brings relevance to book learning."* Working in the community enables people to get a better understanding of their abilities and interests: *"...it's a time when one realizes what their abilities and interests really are by working in the community...one develops contacts in one's field of interest."* Many students stress the importance of getting in touch with the reality of the world they will eventually work and live in: *"Experience is the best teacher." "Involvement within the general public allows one to gain diverse exposure to the needs of society. Community links are one of the best things about CNR - most of the university lacks this, which is blind. We must enter the community eventually anyway." "Since conservation is community orientated, exposure to organizations already at work is very important in education. Too bad other majors don't get it." "Community experience is essential for a well rounded CNR experience. It should be required."*

Students see practical experience and community work as an essential and integral part of their CNR education, rather than something one does if one has a bit of spare time. The range of things people involve themselves in is virtually unlimited. The titles of a few "supervised group studies" (198's) for the 1979-1980 academic year will give a hint of their breadth in both academic and community applications: "Women in Nature - Feminist Perspectives on Nature"; "Berkeley Earth Day '80 - A Celebration of Community Self Reliance" (a community event that attracted 5,000 people); "Local Land Use Regulations - Legal Theory and Practice"; "New Games - Theory and Practice"; "Education for Democratic Action (which created "Teach In - Learn In on the World Crises", a true interdisciplinary educational event bringing together natural resource specialists, political scientists and others to focus their knowledge on the emerging world crises, that drew over 2,000 persons for a day long event); "Integrated Study of Israel - Economics, Culture, and Philosophy", (done in preparation for a group internship in Israel); "Nuclear Safety - The Lessons of Three Mile Island"; "Controlling World Resources: US Foreign Policy and Resource Development and Allocation"; "Environmental Media - Techniques and Applications in Communicating Environmental Issues". Students engaged in these creative intellectual and applicational pursuits generally had a very high level of involvement, and undertook a sustained effort much greater than for an average course, because they were the prime generators of the experiences, yet were not alone or unsupported by University structures.

Graduates, if anything, were more enthusiastic about their practical experience than undergraduates in terms of its later value in their work and lives, especially with respect to their internships. In addition to the points made by current students the most salient value for graduates was the importance of these experiences, in innumerable ways, in making the transition either to the working world or graduate school. That is, these experiences lead directly or indirectly to jobs and careers, and contributed to getting into graduate or professional schools. This relationship is well developed by a woman ('75) who is the Dean of Continuing Education at a university in San Diego. She states; *"Most importantly, these programs allowed me to develop my creativity and initiative in solving environmental problems, and gave me real world experience with the support of solid academic standards. I learned how to solve real world situations through other people, across disciplines, how to research issues, to question authority when appropriate and to integrate my skills and knowledge productively into the 'system'."* One 1973 graduate put it this way; *"There is a major difference in the way the outside world thinks and acts and the world of the university. Exposure to how the outside world works aids in the transition from one to the other, without which many students may take unnecessary time to adjust and become effective."* Adding perspective and seeking the key to the contributions of independent studies in the community is this statement from a 1972 graduate; *"...[it]...has contributed the most to my education, then and to this day. I suspect the key was involvement!"*

This analysis could be carried much further, but to avoid extensive overlap it is more appropriate to shift to an examination

of internships. Many of the factors we will develop there also apply to experiences gained through field studies and other courses.

Internships.. In several significant ways internships are the "high-point" of the CNR program. They often serve as the "academic-practical" synthesis that moves a person forward into the next phase of their life, whether it be directly into a career, or into advanced educational programs. The internship option in CNR is unique in many respects which have contributed to its value: 1) there is not a formal set of internships available to students; rather there is a file of several hundred potential internship sites in the Resource Center, along with comprehensive student reports on over 300 completed internships. Students are encouraged to seek out and develop their own contacts and internships to meet their unique interests and needs, in collaboration with faculty or any other resource people who may be able to help them, 2) though the program has a coordinator to facilitate all of the necessary ground work and paperwork, students must work in close collaboration with a faculty member of their choice, in the conceptualization stage, as well as throughout their internship. Their faculty sponsor's expertise is usually closely related to the area of the internship, so that critical analysis and appropriate disciplines can be more fully brought to bear, both in shaping the internship, and in realizing the full potential of the experience once it has been embarked upon. The breadth of the internships that are possible is indicated by the list of category headings in the internship reports' file. A significant number of these have been undertaken in other countries covering every continent. The numbers in the parentheses are the approximate numbers of persons who have completed internships in each category. Category headings include: *Advocacy and Lobbying(13); Air Quality(7); Appropriate Technology(5); Coastline/San Francisco Bay(8); Community Self-Reliance(1); Ecosystem Design and Computer Modeling(8); Education (3); Energy-Nuclear(15); Energy-Solar(7); Environmental Education(24); Environmental Impact Assessment(14); Food/Food Raising(10); Health/Social Welfare(18); Housing/Design(3); Information Centers/Clearinghouses(1); Land Use/Open Space(5); Law(1); Livestock/Rangeland(5); Media(7); Minorities/Third World(5); World Planning Center(1); Nautral History/Natural Science(14); Natural Resource Management(10); Natural Resource Management-Forest(6); Parks/Outdoor Recreation(24); Pest Control(7); Planning-City(8); Planning-County(15); Planning-Regional(3); Planning-State(3); Plants(4); Social Change(2); Transportation(2); Water-Conservation and Use(7); Wilderness(13); Wildlife(16); Wildlife-Marine(1); Women-Health Collective(1); Water Quality(6).*

Internships became (structurally) fully available with adequate support mechanisms in 1974. Since that time the use, and intended use, of internships has steadily increased. For example, in 1976 fifty-six percent (56%) of CNR's students responded yes (35%), or maybe (21%) to the question, "Do you intend to do an internship?"; in 1980-1981 seventy-four percent (74%) of CNR's students responded either yes (54%), or maybe (30%) to the same question.

Sixty-five percent (65%) of the graduates from the years 1974-1979 in the Follow-Up Survey included an internship in their program. Of those who did internships, 100% found them to be of either great value (89%) or moderate value (11%). (The quantitative data is presented in full on pages 70-71).

One of the most significant findings from the CNR Follow-Up Study (1980), which included over seventy persons who had completed internships, was that out of those who took internships but did not go directly on to advanced schooling after graduation (between 60% to 70% of the total sample) a full sixty percent (60%) of them got a satisfying job drawing on their areas of interest, either directly or indirectly, as a result of their internship. This is an important accomplishment in this era of tight job markets. For example, a 1977 graduate comments; "*My internship in Alaska directed my study for the remainder of my time at the University - I took classes it showed me I needed. Two of the major jobs I have had came almost directly from my internship - through contacts and special training I received during my internship.*" Or from a woman graduate who is a planner with the State of California, Air Resources Board; "...[her internship]...*related to public advocacy (poverty law)...helped me see through lower class eyes - at least a little bit. I think it gave me a perspective which can easily be forgotten in environmental planning. My work with neighborhood legal assistance was definitely a major factor in persuading my first employer at the Air Resources Board to hire me (he was the Baord's Legal Counsel).*" The subtle webs that develop from the ability to follow leads is illustrated in the following comments from a 1975 graduate who is now in a PhD program in Agricultural Journalism at the University of Wisconsin; "...[independent studies/internship]...*eventually led to work for the University as a Research Associate in agricultural economics. This experience helped me gain employment with the National 4-H Council, which aided me in gaining a graduate assistantship* [newswriter for the school of agriculture] *at the University of Wisconsin.*" A woman graduate from 1974 phrases it this way; "*My internship was the most valuable and influential in developing my relationships between education and career goals* [she is a GS-9 Biological Information Specialist with the U.S.F.S.]...[it]...*provided the footsteps to a career in the U.S.F.S. They liked my work, my "generalist" background, my study habits, and my ideas.*"

Equally compelling is the relationship between internships and getting into advanced degree programs, and the shaping of a person's work once there. For example, a woman ('76) who is completing a PhD in Population Biology at Princeton University comments on her internship; "*Invaluable. My internship gave me time and experience which enabled me to focus my career choice in an area where I will be (hopefully) most effective, and personally satisfied, i.e. research....If I had gone straight into the job market* [without an internship], *I suspect I would now be a second rate "professional" in an area that didn't utilize my real talents - and nobody would have been very happy.*" A woman attorney ('75) who works as a plan reviewer for a public interest environmental law firm, reflects on her internship; "[my]...*single most valuable undergraduate experience - worked with Berkeley Community Development Commission...it got me into graduate school - and was valuable planning review experience similar to my current work.*" A

young man currently in a PhD program in Sanitary Engineering at U.C. Berkeley responds; *"I worked for the Oceanic Society at the Water Pollution Control Board. This stimulated my interest in Sanitary Engineering, led to my research, my graduate work, and valuable contacts for future jobs."* One of the most intriguing stories is told by a woman ('78) who did her internship in Guatamala with an Inter-Community Agricultural Project studying classic Maya village sites, especially their agricultural practices. She is currently completing her PhD at U.C. Davis, and with the support of a government grant is co-authoring a book on traditional agriculture. In reference to her independent studies she states; *"The internship meant everything to me. It gave me confidence in myself as a field researcher, and got me into graduate school, and has opened many doors for present and future field work for me!...I spent last year in Guatamala adding to the research I did as an intern, have given papers at conferences in Philadelphia and Tucson, got a job co-authoring a book, showed me it was what I wanted to continue doing."* Finally from a man ('77) in a graduate program in environmental toxicology (pesticide effects on organisms) who states; *"The internship has been invaluable. It allowed me to work intensively in the field, to gain experience and as a consequence I have gone completely into the area of pesticide toxicology (as it relates to pest management)."*

In examining these and other graduates' reflections on their internships it is clear that it is just because students can craft and build toward their own unique internships that they have been so successful. A formal internship program using a pre-determined set of slots, which is the typical model, could not obtain the same creative and focused results. It is in CNR's climate of trust, respect and support that these accomplishments can emerge with such frequency. The decision on an internship is optimally made in discussion between faculty advisor, the student, and the faculty sponsor. Other administrative and coordinating functions should facilitate and support this process, rather than pass judgement on the mutual decision of those in the optimal position to know what best serves a person's needs.

The use of many courses and independent studies that lead to an internship and beyond to even internationally acclaimed results is illustrated in the instance of the young disabled woman ('76) who has already been quoted elsewhere. Her evolution in creating Berkeley Outreach Recreation Program (BORP) is similar in pattern to many other significant success stories. Her early focus was on making the "environment" and "recreation" accessible to the disabled. She undertook many field experiences prior to her internship - which was as the first director of BORP which she created with a number of grants from the city and elsewhere. Among these field experiences were the construction of a wheel-chair accessible vegetable garden, developing a wheel-chair sports and recreation program, and initiating one of the most successful ever student initiated classes (a CNR 198) in "Understanding the Disabled". She comments; *"...because of field work and community involvement I was awarded a study grant in Australia; and a grant to attend a World Recreation Conference in Berlin...*

and job offers with several international organizations...by writing grants, and lobbying the City Council I learned the techniques necessary to initiate change and interest from established systems. I also learned how to write and speak effectively, to communicate ideas...to become a leader instead of a follower."

A second example is the current student who has used her internship to produce a professional color film "Es Difícil Escoger" (It's Difficult to Choose) a 'nutrition education' film in Spanish for young Chicano children, a first in its genre. It seeks to discourage the use of junk food, and encourage the use of nutritious food. The film has gained considerable critical acclaim in educational circles. This student's Area of Interest is 'the political economy of food resources and nutrition education'. She, rightly, viewed the film project as an ideal synthesis of her education. Previous field work over an extended period of time in the Nutrition Education Division of the Oakland Public Health Department; where she worked in schools, in the development of nutrition curriculum, and in teacher training, led her to see the <u>real</u> need for such a film and gave her the essential experience to construct it. She, thus, was led to write and subsequently receive a grant for $26,000 from the State Department of Education - Child and Nutritional Services Bureau. In the process of creating the film - script, props, production, filming, editing, research, she was able to involve more than a dozen other CNR students. The woman who created BORP also involved many CNR students. Thus, these two women, as several others have done, were able to conceive a project, gather the essential resources and engage many in the CNR community in exciting and creative projects, that not only contributed vitally to each person's education, but also made a significant and lasting contribution to the larger community. From many perspectives BORP and "It's Difficult to Choose" are wonderful examples of what CNR strives to facilitate in its educational program. They would not have been possible without extensive, coordinated, and integrated use of independent studies, including internships.

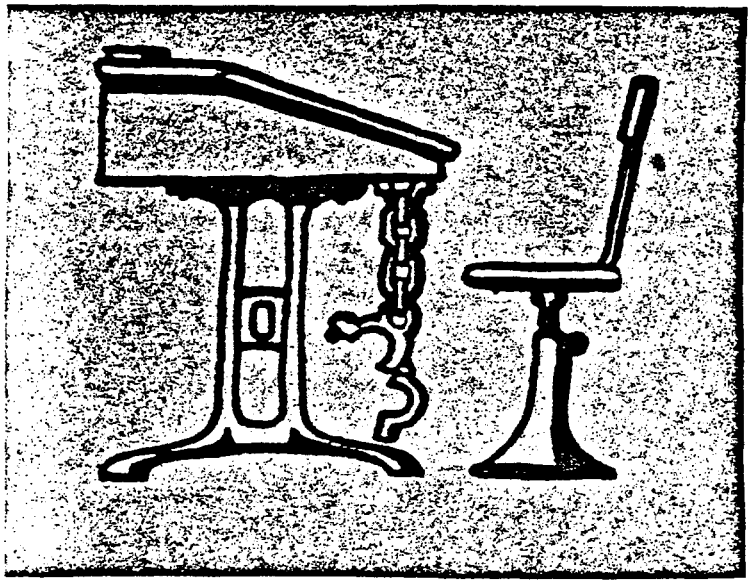
<u>The prospect of an internship solidly at the heart of one's area of interest has often served as a powerful motivating and focusing force for students' academic studies</u>. Currently, for example, a woman has embarked on an intensive program in Latin American Studies and Spanish in preparation for an internship with an International Nutrition Project in Latin America. The excitement of a compelling <u>real world</u> reason to focus one's studies and expertise, has brought out the finest qualities in the individual's search for knowledge. Another current example is a group of three students who have been doing intensive study of the environmental, social, cultural, and economic conditions of the Middle East in preparation for an internship (Spring '81) at the Ben Gurion Institute in the Negev Desert, Israel (An Environmental Education and Research Center for Desert Ecology). They applied for and have been awarded three "President's Undergraduate Fellowships" to help finance their internship.

Finally in completing this analysis of the impact of internships and independent studies, some additonal comments from graduates will further round out the picture. A 1978 graduate who was a lobbyist for "Friends of the Earth" in Sacramento, and is now in charge of environmental news for California Public Radio, states; *"Absolutely the best, strongest aspect of the program. These options were essential to where I am now. They made all the difference in the world. I'd be nowhere without them."* A woman ('78) who is the Co-Director of a large Re-Use Center (a place where a wide range of materials and equipment is gathered from various sources and redistributed at a nominal cost to non-profit institutions, e.g. schools, etc.) comments extensively; *"It* [independent studies/internships] *was/is indispensable to have my work or learning related to my social and political activity. Community work was where I either used my school learned knowledge, or tested out theories I had been exposed to in classes. My internship led to a full time job which was not well paying enough to stay with, but there I gained skills which I continually use in my political and environmental work and which enabled me to get my current job."* A young man ('75) who after graduation taught environmental education and did youth work with Aboriginal juvenile offenders in the Northern Territories of Australia, and is currently a California State Park Ranger working in Urban Interpretation among disadvantaged youth in a cross-cultural setting, comments; *"...*[independent studies and internships]*...1) gave me a clearer idea of the realities and routines within my career dreams at that time; 2) allowed me to avoid pitfalls and reconcile my value system with outside job realities...Provided a window through which various opportunities were visible in grass-roots conservation activities. Assisted in filtering out and testing goals against personal limitations and availability of career opportunities."* Lastly, a Latino graduate ('76) who is a graduate Law Clerk with a Community Law Fellowship speaks as follows; *"Field study provided me with the experiences and insights that I have successully applied to my work during the past four years since graduation."* His area of interest within CNR was "Urban Communities". He goes on to say of other independent study experiences; *"...provided critical analysis of institutions which are still applicable to my work now."*

Some critics have maintained (usually without systematic analysis and supporting data) that programs like CNR make excessive use of independent studies and community experiences. The substantial evidence in this study supports the conclusion that students, on the whole, are judicious and wise in their use of independent studies and community involvements. These experiences have been shown to make unique contributions to CNR students' educations, careers, and lives. Data comparing CNR students and graduates with UC students and graduates in general adds additional support to this conclusion. That is, CNR students and/or graduates are, for example, more satisfied with their educations, with their careers, and are more frequently employed in jobs that use the knowledge and skills they gained as undergraduates than U.C. graduates in general (see data page 9-19). CNR graduates frequently lamented the fact that they hadn't taken greater advantage of the many community involvement options, particularly internships, while they were students in CNR. The comments of a 1977 woman graduate, who is

developing an Environmental Education Program and Site for an entire school district as a permanent professional employee (without an advanced degree or credential) speaks tellingly to this point; *" I did more* [community involvement/independent studies] *than anyone I know. I knew my direction and gained from being able to pursue it. They were my education. I learned skills in how to work on problems and how to work with and help teach people. These skills are more important in what I am doing than a set of facts. I came out of CNR with a lot of job experience - so that I haven't had to take any unrelated job to earn money. I am doing what I want to do - CNR helped me to find this out and get the experience necessary to do it."*

In conclusion. The evidence we have presented in this section, along with previously presented evidence, strongly demonstrates that "independent" studies, including internships, make unique and important contributions to students' education in CNR. Graduates overwhelmingly report that these experiences have contributed significantly to their careers and/or advanced studies, as well as to their lives beyond the undergraduate experience.



4. CNR Students' Grades

The academic record of CNR students relative to other U.C. undergraduates will add perspective to the examination of CNR's curriculum and teaching.

GRADE POINT AVERAGES (GPA's)

All CNR Students (winter 1981; 327).....	2.91
-CNR lower division (93).....	2.68
Freshmen/women (51).....2.64	
Sophomores (42).....2.71	
-CNR upper division (234).....	3.00
Juniors (122).....2.92	
Seniors (112).....3.08	
All UCB Undergraduates (spring 1980).....	3.00
-UCB lower division.....	2.89
-UCB upper division.....	3.02
CNR Students Graduating - 1973.....	3.15

(source: *Messenger Report, page 66*)

CNR students' Grade Point Averages are essentially the same as those of U.C. undergraduates in general and have remained relatively constant over the years (see Messenger Report - 1974, pp. 62-67 for more extensive earlier data). Virtually the entire difference between the overall GPA of CNR students and UC undergraduates in general (2.91 vs 3.00) is accounted for in the difference between lower division students in each group. Thus, though students who enter the CNR major in their freshmen/women and sophomore years have lower GPA's than their UC counterparts on the rest of the campus; CNR juniors and seniors have GPA's that are equivalent to their peers across campus. Several interpretations of this increase are, of course, possible: 1) students entering CNR as juniors (the largest percentage of CNR students) have higher GPA's upon entering the major than students who enter earlier; 2) CNR students develop a higher level of motivation than UC students in general, hence the increase; or 3) CNR students, on the whole, select easier courses of study, in terms of grade distributions, than UC students in general. The GPA of all students increases as a function of class standing. The issue here is the apparent differential rate of increase between CNR and other majors. This issue does not fall directly within the purview of this study so the necessary data were not collected to conduct the appropriate analyses. In any case, the differentials are not very large to begin with. The

Messenger Report - 1974 did examine this question at some length (pp 62-67) and concluded that CNR students were no more likely to be taking an "easy ride" than students in any other major on campus. There is no data, or reason, to suggest that the analysis developed in the Messenger Report does not continue to hold.

There is no evidence that students come to CNR for an "easy ride" or take an "easy ride" through CNR, any more frequently than they do for any other program on campus. In fact all of the evidence that has been presented thus far indicates just the opposite. It suggests that CNR students are far more dedicated to, and serious about, their education than the average student on campus. No one is more aware of, and incensed by, a free loader than their fellow students. It is in this context that the responses to the following question take on added meaning and contribute to the above conclusion.

People responding to the various studies used in this report were asked: I was impressed by the calibre of motivation of the other students in the major.

Motivation of fellow students: Means of CNR and comparison groups

CNR-ARU 79..... 4.03	Life Sciences-ARU(18)... 3.63
CNR-Follow-Up... 3.76	All Programs-ARU(40) ... 3.47
Rank-CNR..... 3rd	(range 2.51 - 4.55)

CNR ranks among the top few programs at Berkeley in terms of perceived student motivation, which is perhaps the best index available of genuine motivation. Responses further suggest that more recent students are perceived as more motivated than past students in CNR, though the difference is barely significant. Corollary support for this point can also be found in the fact that a substantially larger percentage of recent CNR graduates (classes of 1976-1979) will eventually earn advanced degrees than earlier CNR graduates (classes of 1971-1975) [see Part VIII, Section 2 - Further Education and Careers of Graduates with Advanced Education].

In 1979 a woman CNR student was the University's Gold Medalist. This award is given to the year's most outstanding graduating senior based on strictly academic criteria. She completed a program in the medical sciences that she could not have done in any other major. When she transferred to Berkeley from a mid-western college she was rejected by other science majors related to medicine because she lacked the appropriate science background. She found support, encouragement and excellent guidance in CNR which she praises highly. She was recently awarded the Regent's Fellowship to Berkeley's small and select Doctor of Medicine program, being chosen from over fifty applicants for this prestigeous award.

A few additional points can be raised about the issue of Grades, Academic Rigor, and Free Loading: 1) So called "mick" courses are only one means, among many, to get through CAL with minimal effort. Other ways that are practiced with alarming frequency, are buying or borrowing "term papers", and any of a myriad of ways of cheating on tests.[14] There is good reason to assume, but no supporting data, that CNR students partake of "other ways" much less frequently than their counterparts on the rest of campus. CNR students are far more free to construct their own programs, and to choose courses that are interesting and meaningful to them. They are also much more likely to know and trust their professors and hence, much less likely to cheat in their courses. 2) There is no evidence that CNR students take any less rigorous academic programs than the average for campus programs (e.g. see the *Messenger Report, pp 62-67*). 3) Grade distributions do not necessarily indicate the real difficulty or challenge of a course. Grade distributions in courses are ultimately arbitrary. Grading scales are inherently relative (even the space between the points on the scale is essentially meaningless [i.e. a score of 40 does not mean one knows twice as much as the person who got a score of 20]) rather than being absolute (i.e. measuring the exact amount of knowledge in the subject matter). This is due to the limitations of measurement, both theoretically and practically, in such circumstances. 4) What GPA has to do with life after school is not at all clear. In over 50 years of research GPA's have not been demonstrated to relate to anything much beyond later grades. That is: grades have no relationship with any index of success or satisfaction in life (given that one actually graduates); in fact grades in either graduate or professional school bear no significant relationship to any indices of later success in the very professions the schools are training people for.[15]

It can be concluded that CNR students, with respect to GPA's, do as well as undergraduates in general at U.C. CNR students are no more likely to be seeking an "easy ride" than U.C. students at large, in fact all of the evidence strongly indicates that CNR students are more serious about their educations than students in virtually all other undergraduate programs on campus.

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14. *See citations and discussion on page 20.*

15. *For example, see David McClelland, Testing for Competence Rather Than for Intelligence, American Psychologist, Vol 28, No 1, pp 1-14, for an overview of this issue. Also D.P.Hoyt, The Relationship Between College Grades and Adult Achievement, a Review of the Literature, (Research Report No 7) Iowa City, Iowa: American College Testing Program, 1965. This holds for scientific contributions too, see C.Taylor, W.R.Smith, and B.Ghiselin, The Creative and other Contributions of one Sample of Research Scientists, in C.Taylor and F.Barron (eds) Scientific Creativity: Its Recognition and Development, New York: Wiley, 1963.*

5. Awards and Grants Won by CNR Students

One appropriate way to assess student initiative, motivation, and the quality of their individual and collective efforts is to examine their success in winning competitive awards and grants.

A. Awards - examples of awards that CNR students have recently achieved.

1. The University Gold Medal - A CNR woman was the 1979 recipient of the University's Gold Medal, awarded to the graduating senior with the most distinguished academic record (see previous section on 'grades' for more detail).

2. Eisner Award - this award is given once a year in each area of the arts for "highest achievement in the creative arts on the Berkeley campus." In 1980-1981 a CNR woman won the Eisner Award in Photography. Her work has appeared on the covers of important environmental journals like Not Man Apart. Her Area of Interest in CNR is Environmental Photo-journalism. Another CNR woman was runner-up in the film division of the Eisner Awards in 1980-1981.

B. President's Undergraduate Fellowships - these are awarded to approximately seventy students each year for projects designed to further their undergraduate education. CNR students win several President's Undergraduate Fellowships every year. While CNR students comprise slightly over one percent of the undergraduate student body they receive well over five percent of these fellowships. For example, currently three students are part of a desert ecology/environmental education project in the Negev Desert at the Ben Gurion Institute in Israel; another will be studying appropriate technology in China this summer (summer '81); and yet another doing a photographic study and report on energy development in the Southwest (summer '81) with the assistance of the President's Undergraduate Fellowships.

C. Grants

CNR students have outdistanced every other major on campus, by a wide margin, in their ability to win internal and external grants to undertake a rich and diverse array of educational projects. Students have had support and technical assistance from faculty and staff, particularly from the Student Opportunities Coordinator in the CRS Resource Center whose responsibilities include catalyzing students' ideas and assisting them in grant applications.

A list of most of the funding sources tapped by CNR students, and examples of recent projects under each of them is presented below:

1. Internal Sources

   a. Council on Educational Development - Instructional Improvement Grants

      -1979-1980. For the development of Area of Interest Groups to enhance advising options in CNR, especially peer advising; and to further students' education in their Areas of Interest.

   b. Committee on Teaching - Mini-Grants

      -1979-1980. To produce a TV documentary on the preparation and presentation of Berkeley Earth Day '80 (a large community environmental education fair).

      -1978-1979. To develop a course to meet CNR's basic reading and composition requirement through environmental literature.

   c. Chancellor's Office - Committee on Publications

      -1980-1981. To publish Ecolog - An Ecological Catalog. An annotated compendium of courses and resources in appropriate technology and ecological design at Berkeley (produced in collaboration with students in Environmental Design).

      -1980-1981. To publish Tellus - Our Common Resources. (produced in collaboration with students in Development Studies). A series of student written articles about resource issues in United States and developing countries.

   d. U.C. Office of Appropriate Technology

      -1980-1981. To conduct a study of a transient interurban electric transportation fleet - to bridge the gap between public transportation and the private automobile.

      -1980-1981. To build a solar greenhouse on UC's Oxford tract.

      -1979-1980. To conduct a wind potential study for the city of Berkeley.

e. ASUC Senate

-1980-1981. To establish Cooperative Connections in collaboration with students from other majors. This is currently a food buying club with the long range intention of becoming a co-op healthy food store in the Student Union and a source for nutrition education on campus.

f. ASUC - Academic Affairs Office

-1980-1981. To establish Chautauqua - A Center for Democratic Education in collaboration with students from other majors. A resource center for student initiated classes and other programs and projects in democratic education. CNR students have been at the heart of the development of both Cooperative Connections and Chautauqua.

g. ASUC - Mini-Grants

-1979-1980. To assist in the presentation of Politics Of Hunger - A One-Day Fair and Teach-In on food and hunger issues that drew hundreds of persons (this project was also funded by the ASUC Community Projects Office, the Office of Student Affairs, among other sponsors).

-1977-1978. Career Forums - a series of forums for students to acquaint them with persons and possibilities in many areas where they might potentially seek jobs.

-1977-1978. To produce a booklet on teaching techniques and resources for the "Application of Environmental Education to Special Education".

h. ASUC - Community Projects Office

-1980-1981. Community Energy Education Project - a comprehensive effort to educate the Berkeley community on pressing energy issues. Initiated in CNR in collaboration with the Community Energy Coalition, another outgrowth of CNR.

-1979-1980. Berkeley Earth Day '80 - A Celebration of Community - an environmental education project of IDS-120 to celebrate Berkeley's progress since the original Earth Day 91970) and to educate about community self-reliance. The fair drew several thousand local residents.

-1977-1978. Berkeley Sun Day - a community fair and associated events in conjunction with the nationwide SUN DAY effort to draw attention to, and educate around solar and other renewable energy sources. These events drew several thousand people.

2. External Sources

-1979-1980. State Department of Education - Child and Nutritional Services Bureau. To produce nutrition education film for Chicano children - Es Dificil Escoger (see section on Internships for further details).

-1979-1980. Vanguard Foundation, San Francisco. For the UNITAS Hunger Action Project, and the Politics of Hunger Teach-In.

-1978-1979. Department of Energy - Small Scale Appropriate Technology Grants. For a bio-mass conversion demonstration plant in Berkeley.

-1977-1978. Environmental Protection Agency - funding for Berkeley Sun Day.

-1975-1976. City of Berkeley, Federal and State grants to initiate BORP (Berkeley Outreach Recreation Program), the first program of its kind for disabled people (see section on internships for further details).

These are only a few of the projects initiated by CNR students with the assistance of these and other funding sources. Some of these, as well as other projects will be described in more detail in the sections on CNR students' contribution to the University and larger communities. In the past two academic years (1979-1980, 1980-1981) CNR students have won over forty awards and grants for various undertakings with a total value in excess of $50,000. In most instances the projects were initiated by a group of students working cooperatively, or by an individual student who then drew additional CNR students into the project once it was funded. The immediate educational value of these efforts for the students who initiated and participated in them has been inestimable as is documented in the narrative data presented throughout this report.

In summary. Few, if any majors can match CNR in the number of competitive awards and grants won, especially those for undertaking various kinds of projects. This constitutes substantial objective data that attests to the creativity, initiative, motivation, and commitment to serve their communities that characterizes so many CNR students. The community within CNR has been an essential element in the development and realization of these efforts, a concrete example of the contribution of cooperation to educational achievement, in contrast to the more prevalent competition. The knowledge, experience, and skills gained in these endeavors have proved invaluable to CNR graduates in their further education, careers or both. Many graduates directly attribute their getting into graduate school and the winning of scholarships and fellowships to the projects they undertook, and gained funding for,

while they were in CNR; while for others projects led directly to jobs upon graduation.

Thus, projects have made central contributions to the educations, careers, and lives of CNR students in several specific ways that academic courses alone are unable to do. They have been valuable complements to course work, each enriching the other, and leading to a more complete and valuable education.

Part III. Advising-all sources

The sources of advice within CNR are multiple and encompass every aspect of the CNR community in both its formal and informal structures. Students are encouraged, in the words of the CNR Handbook, "to seek advice from everyone, everywhere, and anywhere." The very existence of the unique CNR community greatly facilitates the realization of that admonition. Thus, in addition to their official faculty advisor it is relatively easy for students to draw on - other faculty, staff, students, the Resource Center, CNR 49/90, Area of Interest Groups, the CNR Student Organization, and periodic retreats for advice and resources; in all probability to a greater degree than virtually any other program on campus. This abundant lode of potential sources of advice and council is essential in a flexible major like CNR where students have major responsibility for constructing their own education in collaboration with their faculty advisor and many others.

Two formal advising structures exist in CNR under the oversight of the Advisors' Coordinating Committee. In the first each student chooses a faculty advisor to work closely with as well as for administrative purposes. The finalization of this choice is by the mutual consent of faculty person and the student. The second structure, which is still in a developmental stage, is Area of Interest Groups. These groups serve to bring together students and faculty around common interests to further enrich all aspects of CNR's educational program, but are especially a place to exchange advice and resources.

The nature and quality of relationships between students, staff, and faculty that typify CNR are distinctive - they are generally collegial and characterized by respect for each other's worth and dignity, as well as by trust and care. There is both structurally and informally a mutual sense of working together, as equals, to meet the common challenge of creating an optimal educational experience for all. The internal, comparative, and follow-up data in this section, and throughout this study, testifies to the value of the kind of relationships typically found in CNR.

How well does the advising system in CNR work? We will present the quantitative data from CNR students, CNR graduates, and from other campus programs. This will be followed by discussion and more detailed analysis drawn from our narrative data.

- The following questions were asked in one, or more, of the questionaire surveys drawn on in this report:

1- The program provides a good general orientation for students new to the major.

general orientation: Means, CNR and comparison groups

CNR-ARU 79.....	4.33	Life Sciences-ARU(18)...	3.49
Rank CNR	1st	All Programs-ARU(40)....	3.26
		(range 2.34 - 4.33)	

2- The program's system of information and advising make it easy for me to choose courses, professors, and to understand best how to meet my academic needs.

system of information and advising: Means, CNR and comparison groups

CNR-ARU 79.....	3.88	Life Sciences-ARU(18)...	3.24
CNR-Follow-Up....	3.98	All Programs-ARU(40)....	3.25
Rank CNR.....	3rd	(range 2.50 - 4.22)	

3- There was enough information and guidance to enable me to adequately develop my area of interest.

sufficient guidance to develop area of interest: Mean CNR Follow-Up

CNR Follow-Up 3.83

5)strongly agree 31.5%; 4)agree 34%; 3)in between 19.5%
2)disagree 11.5%; 1)strongly disagree 2%; No resonse 1.5%

4- Considering both limitations and possibilities, how would you evaluate the effectiveness of your advisor?

effectiveness of advisor: Mean & percentages CNR Student Initiated

Student Initiated Questionaire 1976 .... 4.02

5)extremely effective 37%; 4) 40%; 3) 18%; 2) 4%; 1)not effective 1%
n.b. 14% of the total sample gave no answer as they were first or second quarter CNR student who had not yet established a permanent advisor.

5- The central feature of advising in CNR is one-to-one conferences with faculty advisors. Have you been satisfied with your advisor?

satisfaction with advisor: Mean and percentages CNR 1980-81 Survey

CNR- 1980-1981 (total sample)..... 3.98

5)very satisfied 38%; 4) 35%; 3) 19%; 2) 5%; 1)very dissatisfied 3%

CNR- 1980-1981 (four or more quarters in CNR).... 4.02

5)very satisfied 37%; 4) 33%; 3) 26%; 2) 4%; 1)very dissatisfied 0%

n.b. 13% of sample did not answer as they were first or second quarter CNR students who had not yet established a permanent advisor.

6- Communication between faculty and students in this program [in CNR] is [was] open and fairly extensive.

communication open and extensive: Means, CNR and comparisons

CNR-ARU 79.....	4.33	Life Sciences-ARU(18)...	3.27
CNR-Follow-Up....	4.46	All Programs-ARU(40)....	3.28
Rank CNR.....	2nd	(range 2.50 - 4.52)	

7- I have a regular faculty advisor (or otherwise know a faculty member in my program) to whom I would feel comfortable going at any time during the year.

comfortable with a faculty member: Means, CNR and comparisons

CNR-ARU 79.....	4.35	Social Sciences-ARU(14)...	3.07
Rank CNR.....	2nd	(range 2.05 - 4.56)	

n.b.- question not asked in other ARU Surveys

8- Students have a regular faculty advisor of their choice in this program.

-It would be (is) valuable to have a regular faculty advisor of my choice.

faculty advisor of choice: have?/ value?: Means comparison groups

	Hum*	L.S*	range
have advisor of choice....	1.96;	2.15;	1.40 - 3.53
value advisor of choice...	4.33;	4.16;	3.77 - 4.70

*Hum.= 8 Humanities majors(ARU); L.S.=18 Life Science majors(ARU)
N.B. *These questions were not asked in the 1979 Survey(ARU) of Social Science related majors that included CNR.*

9- At least one professor knows me or my work well enough to write me a good recommendation for graduate school or a job.

knows a professor: Means, CNR and comparison groups

CNR-ARU 79.....	3.47	Life Sciences-ARU(18)...	2.87
Rank CNR.....	3rd	All Programs-ARU(40)....	3.00
		(range 1.90 - 4.04)	

10- Faculty members in this program don't really seem interested in or concerned about undergraduates.

faculty not concerned with undergraduates: Means, CNR and comparisons

CNR-ARU 79.....	1.78	Life Sciences-ARU(18)...	2.64
Rank CNR	2nd*	All Programs-ARU(40)....	2.63
		(range 1.42 - 3.20)	

* Order of ranks reversed to maintain a positive direction of ranking for all questions.

11- The faculty and program [The CNR program, faculty and staff] provided enough information about career opportunities for students with a bachelor's degree in this major.

information about career opportunities: Means, CNR and comparisons

CNR-ARU 79.....	3.44	Life Sciences-ARU(18)...	2.49
CNR-Follow-Up....	3.13	All Programs-ARU(40)....	2.50
Rank CNR.....	2nd	(range 1.68 - 3.90)	

n.b. *It is interesting to note that the only major to rate higher on this question than CNR was Business Administration.*

12- The faculty and program provide enough information about graduate and professional school programs to which I might want to apply.

information about graduate and professional schools:

CNR-ARU 79.....	3.27	Life Sciences-ARU(18)...	3.03
Rank CNR.....	6th	All Programs-ARU(40)....	3.01
		(range 2.35 - 3.75)	

13- In the past year [1979-1980] CNR has been developing Area of Interest groups, in part, as an adjunct to individual advisors to further compliment peer and faculty advice and support.

Area of Interest groups: CNR 1980-1981 Undergraduate Survey

- Do you think these groups are a good idea?.....mean 4.50

  5)yes, definitely 60%; 4)31%; 3)7%; 2)2%; 1)No, not at all 0%

- Will you join and attend a group if it is formed in your Area of Interest?

  yes - 65%; unsure - 31%; no - 4%

14- The program's office staff are generally quite helpful.

office staff helpful: Means, CNR and comparison groups

CNR-ARU 79.....	4.53	Life Sciences-ARU(18)...	3.91
Rank CNR.....	2nd	All Programs-ARU(40)....	3.96
		(range 3.50 - 4.79)	

Discussion. CNR students' assessment of all of the facets of "advising" place CNR first among all forty programs surveyed by the ASUC-Academic Review Unit (i.e. CNR's average rank across all of the questions included in the ASUC-ARU surveys was higher than any other program). CNR students have consistently over time given high ratings to advising in the program (e.g. surveys in 1976, 1978, and 1980-1981). CNR graduates continue to give excellent ratings to the advising they received in CNR from their current perspectives in advanced degree programs or careers. Certainly no one is in a better position to judge the quality of advising received than a graduate who has tested his or her CNR education in advanced degree programs, or in the world of work. We can only conclude that, in an absolute sense and relative to other Berkeley undergraduate programs, the advising system in CNR is effective and one of the best, if not the best, on campus. Thus the system of advising worked out in on-going collaboration between faculty, students, and staff, and which is continually evolving, has proven to be very effective in achieving its goals.

CNR ranked first among all surveyed programs in its effectiveness in orienting students coming into the program (see quest.1). This is particularly significant given the relative complexity of CNR's program in comparison to other majors. It testifies to the quality of CNR 49/90, CNR materials (e.g. handbook, etc.), staff, and faculty. The programs system of information and advising and its ability to enable persons to develop their areas of interest were given high ratings (see quest. 2,3) which persisted after graduation. CNR students have found their faculty advisors to be effective, helpful, and open, especially relative to other programs on campus (see quest. 4-7). For example, CNR students ranked second among surveyed campus programs in their feeling comfortable about going to their advisor or a particular faculty member for advice whenever they needed it (see quest. 7). CNR students felt faculty members in CNR were interested and concerned about their education (CNR ranked second among all programs, see quest. 10), and that communication was open and extensive between faculty and students (CNR ranked 2nd, see quest. 6). The concept of Area of Interest groups has overwhelming support among CNR students and would be joined by the great majority of students (see quest. 13). In the first year of their existence (1979-1980) over one-hundred CNR students have been involved in these groups.

The extent and quality of advising and communication within CNR is in sharp contrast to that in most campus programs. In the majority of programs advising is generally limited to ascertaining whether or not a student is fulfilling the major's prescribed program of study. Typically students do not have the advisor of their choice, though they would prefer one of their choosing (see quest. 8). In most programs the majority of students do not know a faculty member they would feel comfortable in going to at any time for advice, or who they know well enough to ask for a letter of recommendation; while in CNR virtually every student knows a faculty member they feel comfortable in going to for advice (see quest. 7), and the majority believe that at least one professor already knows them well enough to write a letter of recommendation (see quest. 9). Further,

nearly 50% of the students in the other programs surveyed believed faculty members in their program did not care much about undergraduate education; while a large majority of CNR students believed that the faculty in CNR cared a great deal (see quest. 10).

CNR students, relative to the students in the other programs surveyed, were more satisfied with the information provided through the faculty and the program about career opportunities (CNR ranked second, surpassed only by Business Administration, see quest. 11). With respect to information provided about graduate and professional schools, CNR ranked sixth among the forty programs surveyed (see quest. 12). Even with respect to information about graduate and professional schools, the question CNR ranked lowest on, CNR was still in the top 15 percent of campus programs surveyed. The overall quality of advising in CNR is reflected right up to the office staff who were given exceptionally high ratings in both an absolute and relative sense (CNR ranked second, see quest. 14).

Analysis. The phenomenon of advising in CNR, particularly students' relationships with their advisors, is a complex and multifaceted one which is barely revealed in the quantitative data just reported. An examination of the narrative responses will open up other dimensions of the strengths and weaknesses of this sensitive and often opaque process. They will reveal that neither simple actions nor arbitrary regulations will yield significant improvement; while at the same time showing where the possibilities for improvement lie.

The task of the advisor in CNR is an extremely challenging and demanding one, which requires at the same time significant responsibility on the part of the students. It is, in its best manifestations, the antithesis of the typical undergraduate advising task in most majors - the relatively impersonal fitting of student to prescribed program requirements. The flexibility and individuality of the CNR major, along with the structural respect afforded students' own judgements, choices, and rights for self-determination lead to a qualitatively different dynamic that students and faculty alike tend to be profoundly aware of. The needs and possibilities vary tremendously from student to student; while the multiplicity of abilities, knowledge, and skills that might be required in any instance vary equally as widely among faculty members. Hence, the need and vitality of mutual choice - student of advisor and advisor of student.

Students coming from other colleges or programs with traditional advising systems sometimes don't grasp the potential value of an advisor in CNR. One outstanding CNR student who is about to graduate phrased it this way: *"I didn't know/understand how valuable an advisor would be so I didn't take the steps to find an advisor or spend enough time with the one I did see. Also I didn't seem to have a grasp on what my area of interest would be."* Special efforts are made, which are usually successful, by staff, faculty, peers, CNR 49/90, and other situations to break through students' previously developed limited conceptions of the

potential value of a good advisor.

What is the nature of a productive relationship between faculty advisor and student in CNR? While some themes are constant in all good relationships, others change to meet unique individual needs. A few statements from the narrative data will serve to set the stage for a more detailed analysis:

A current student describes her relationship with her advisor as follows: *"She gives all avenues of approach and does not pass judgement on any. Rather, she presents both pro and con and then we both decide which way to look into. Eventually the final decision is in my hands which thus allows a greater freedom of interest expression."*

The CNR graduate who established the Berkeley Outreach Recreation Program as a CNR student assesses advising in CNR as follows: *"My advisors were available at all times to discuss my courses and offer support and critical reflection to the choices I was making...when I decided the courses I wanted to take - my advisor made me feel that I was in control of my education - while at the same time made me reflect and defend my opinions through critical analysis of my reasoning...none of my other educational experiences outside of CNR* [she has studied at a number of graduate schools] *has ever been as supportive as CNR!"*

A 1973 graduate who is making many unique contributions to her community reflects on her advisor: *"Great...*[he]*...gave me freedom, trusted my instincts and treated me like a responsible human being."*

"My advisor was excellent. He never pressured me with pre-conceptions or moral obligations. He listened, answered questions, and suggested possible directions for me to follow: thus I was most free to pursue my own inquisitiveness." ('78)

A 1976 graduate in her residency, having completed medical school states: *"Some of the best guidance I've ever received. I certainly feel priviledged to have had this kind of advice in an institution which otherwise treats one in an impersonal manner."*

*"My advisor is good at assisting - not directing and not ignoring."**

A 1975 graduate who is a PhD candidate in Sanitary Engineering at U.C.B.: *"My advisor listened and helped instead of dictating. I knew what I wanted and wouldn't have stayed in school if somebody was telling me what to do."*

"Excellent,...took time to help me with every conceivable problem a student could confront." ('74)

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* *n.b. The comments where year of graduation is not indicated are from current students*

"...helped me feel confident in approaching various professors with questions because my relationship with my advisor was so positive." ('77)

From a woman ('77) who is currently completing medical school: *"Suberb! I knew what direction I wanted to head, but I really wanted intellectual response and feedback - a real exchange of philosophies and a chance to learn from people and their individual wisdom...*[gaining this]*...was very important to me."*

A current student, with quite different needs, who was feeling terribly lost in the University and life responds: "...[she]...*conveys a sense of caring about me, my education and most importantly my personal happiness here at U.C. that I am motivated to study and do well! She has been instrumental in helping me to find a tentative direction within this major."*

These assessments are fairly typical of the majority of CNR students and graduates and represent the substance behind the high ratings reported earlier in this section. We will examine the themes that run through these comments; while at the same time show how the obverse of the theme is perceived as a weakness when it is present. It is clear that CNR students expect, and generally receive, more from their advisors than is the case in the typical undergraduate program with impersonal advising systems. One further caution will be helpful before proceeding, and that is we must remember that both faculty and students differ substantially one to the other in their potentials, their strengths, and their weaknesses. While the tendency in judgements made by faculties is to blame students for inadequacies that are largely the institutions; students, on the other hand, have a tendency to blame faculty advisors and the institution for their own limitations and inadequacies. The truth lies somewhere in between, yet the University clearly bears the responsibility to attempt to bring out the best potentials in <u>every</u> person it admits.

<u>The key characteristics of the excellent advisor-advisee relationships that tend to typify CNR are</u>:

1) As we have already indicated the high quality faculty-advisee relationship is one <u>where each person recognizes the equality of worth of the other</u>. <u>A substantial and often long lasting relationship is developed that is characterized by mutual trust, respect and care</u>. For example, a 1975 graduate who has just been nominated "Woman of the Year" says of her advisor: *"GREAT! It took away the gap between faculty and student...I appreciated the rapport I had and still have with my advisors, in addition to the moral support offered."* It is often just this establishment of a full and humane relationship that makes the critical difference in enabling a student to reach toward his or her educational potentials. The current student quoted earlier captures this when he says: "...[my advisor]..

conveys a sense of caring about me, my education and most importantly my personal happiness here at U.C. that I am motivated to study and do well!" A 1974 graduate who is a freelance naturalist and educational consultant states;"...[my advisor]...*is still an inspiration, we didn't have a practical item to item relationship...it was more important to have a spiritual, warm, open, and friendly guide."*

Students, for the most part, recognize that they share in the responsibility for developing a good relationship with their advisor. A student who recently entered CNR expresses it this way; *"Have had little contact so far and little of it has been personal - (i.e. getting to know each others' interests, backgrounds, strengths, weaknesses, etc. which I would like to develop further). Responsibility for limited contact up til now rests primarily with me."* Students also recognize it when such a relationship is not forthcoming, and regret it when such is the case. For example, *"I expected better - somehow my advisor is just going through the motions - just suggesting like, but not really talking - but still better than others (i.e. from previous departments I have been in)."*

2) Advisors are supportive of students as persons, and of their efforts to shape their educations and lives. They recognize that education and life can not be meaningfully separated, and function from that understanding. Though this is implicit in the first theme it appears so frequently and emphatically that it deserves highlighting. For example, "...[value of advisor?]...*Yes, he has supported me in all of my efforts to create a better, more challenging course of studies, and I can call him any time I have any troubles."* It is this kind of support directed at helping individuals develop and realize their own visions, rather than being pressured into preconceived molds that are program imperatives, not human imperatives, that is central to effective advising in CNR. A subtle and difficult line to tread, but one CNR advisors have generally striven for. A fairly divergent example will clarify this point. A 1979 graduate whose initial Area of Interest was Water Chemistry and Sanitation, but shifted to Environmental Art late in his CNR career, comments as follows on his advisor; *"I feel my advisor did everything possible to encourage me to focus on what it was I wished to do even though it lay outside of the traditional boundaries of coursework in the college."* This graduate is now an artist and muralist who is very satisfied with his evolving career and life. While a student in CNR, he helped organize, and played a major role in designing and painting the striking mural in the College of Natural Resource's Giannini Lounge.

Establishing substantial, supportive, and caring relationships is necessary, but not sufficient, for an optimal advisor-advisee association. Contrary to what one often hears from critics, students and graduates are generally aware of this and tend to seek out more than just a good human relationship. For example, a 1976 graduate who is in medical school states, "...[my advisor was]... *Supportive, but not very helpful in actualities of what to do. But I appreciated the support and flexibility."* A 1978 graduate probes deeper into the

complexity of this issue, "*A paradox for me, I found that I didn't get as much guidance as I wanted - which made me take responsibility for my decisions. However my advisor remains a special friend and resource.*" What these data typify is the ability of most students to not fall into categorical judgements. They can appreciate and draw on what their advisors have to offer; while at the same time be aware of their advisor's limitations and meet their unmet needs elsewhere.

3) The essential ingredient in the optimal advising relationship which can only be fully realized in conjunction with the conditions discussed above is the development of a critical dialogue between advisor and advisee. Paulo Freire, the distinguished Brazilian educator, captures the essence of this when he says; "Without dialogue there is no communication, and without communication there can be no true education...Dialogue cannot exist in the absence of a profound love for the world and for men. If I do not love the world--if I do not love life--if I do not love men--I can not enter into dialogue." The CNR graduate who best expresses this sense is quoted at the beginning of this section, but her analysis bears repeating here; "*My advisors were available at all times to discuss my courses and offer support and critical reflection to my choices I was making...when I decided the courses I wanted to take - my advisor made me feel that I was in control of my education while at the same time made me reflect and defend my opinions through critical analysis of my reasoning.*" Students are often aware of this need, if only intuitively. They appreciate the time it takes to develop relationships of quality. A student who is relatively new in CNR puts it this way; "*I respect my advisor's experience and I feel I have a lot to learn from him, but I haven't yet established relaxed communication with him. I think this will come with time.*" When optimal conditions are absent students are usually aware of it. One current student phrases it; "*My advisor is a wonderful person, but doesn't give me much help as far as course planning and feedback about things I have done.*" As one student who was quoted earlier put it, "*...I really wanted intellectual response and feedback - a real exchange of philosophies and a chance to learn from people and their individual wisdom* ...[gaining this]... *was very important to me.*"

4) Advisors play an important role in helping large numbers of students to determine and continually re-shape their Areas of Interest, and course of studies. The breadth and flexibility in CNR enables students, as we discussed in the section on "flexibility", to sequentially evolve their focus from their initial broad general interests, as a result of their courses and other experiences while in CNR. The continuing dialogue with one or more faculty members is often a critical aspect of this process. For example, a 1976 graduate who holds a prestigious community law clerk fellowship comments; "*I had an especially sensitive faculty advisor who provided guidance and rational suggestions in forming an area of studies uncommon even within CNR* [Urban Communities]." Or more specifically, the 1977 graduate who is a Ph.D. candidate in Epidemiology at UCLA when he states; "*My present choice of occupation was due entirely to good advising. I was directed to a course in epidemiology which has turned out to be my career choice.*"

A small minority of current students and graduates expressed a need for more critical dialogue, and in some instances more direct guidance (e.g. a firm push). For example, *"Advisor is good, but perhaps hasn't given me enough push and pull - devil's advocate type advising."* Or, *"I fail to take the initiative in finding an advisor who could provide the direction and guidance I needed. The advisor I did select...was excellent and supplied many useful suggestions. The fault lies with me due to immaturity, and lack of initiative, not with him ('72)."* A 1974 graduate reflects; *"I loved my advisor but could have used more advice on what would be useful in a career. I needed to be pushed into tougher courses and challenged more than I was."* This was especially true for a number of students whose Areas of Interest shifted to more solid natural and physical science areas later in their CNR careers and found themselves ill-prepared for graduate schools or jobs reflecting the changed emphasis. A 1977 graduate who is in a Ph.D. program in Environmental Engineering at UC Berkeley states; *"I wish he had been more pointed and pressed harder on me to be exact about what I wanted to do."* This issue is discussed at length in Part II, section 2 of this report "flexibility and responsibility". Other graduates, again only a small number, felt that their advisors could have been more helpful in directing them toward careers. For example, "...[my advisor]...*could have been better - especially career opportunities and how to fit my education to those opportunities. Should have made me think more about what I wanted to do and different ways to get there ('76)."* Or, *"My advisor was so agreeable to everything I wanted to take that he didn't advise of what to take for possible career opportunities later on. I have suffered the most from this because while I thoroughly enjoyed my education, I did not come away with a strong background in anything ('77)."* Career advising is a function not generally performed by advisors in typical advising programs on campus. It tends to be relegated to the Career Planning and Placement Center. CNR, both in terms of its advisors, and the Resource Center, does make a substantial effort to help its students prepare for and locate jobs and careers. CNR placed second, surpassed only by Business Administration, among the programs surveyed by the Academic Review Unit of the ASUC in its adequacy in providing information and advice about careers.

In examining where advising has failed, in some instances, with respect to preparation and information about advanced degree programs and careers as assessed by students and graduates, we must be aware of individual differences. It is, for example, the more successful graduates - relative to quality of contributions to society, pursuit of advanced degrees, and career satisfaction - who tend to praise their CNR education and advising the most highly (e.g. the young woman (1976) who went on to become an international leader in Recreation for the Disabled returned one of the most detailed and laudatory assessments of her education and advising in CNR and the Follow-Up Study). Those who gave balanced pro and con evaluations of their education and advisors also tended to be successful and satisfied. Like the 1974 graduate quoted in the previous paragraph ("I loved my advisor, but ...") who now has a responsible and rewarding job with the Department of Interior in Washington as a Heritage Specialist. While the few who gave negative evaluations of their advisor and more or less mediocre ratings to their CNR education usually were in positions which in their own judgements were pretty unrewarding.

For example, a 1976 male graduate who is a flight attendant speaks of CNR's advising system as follows; *"Terrible - created unrealistic expectations of employment potential of a CNR education."* The issue these findings raise is the obvious one. To what extent are these dissatisfactions and relatively low levels of accomplishment after graduation a function of individuals' potentials and personalities, and to what extent are they a failure of the program? This is a sensitive question, for depending on the point you want to make, it is very easy to fault either the program or the individuals; while ignoring the complex interactions that may actually be at the heart of the phenomenon.

Thus, we do not mean to suggest that CNR should not make efforts to improve its ability to reach that portion of its students who do not seem to be optimally served by the advising system. Though, it is important to note that the apparent weaknesses exist in a system of advising and advisors that serves its students as well as, if not better than, any other program on campus that has been surveyed.

In the presentation of the characteristics of good advising in CNR there is one structural factor, in contrast to the substantive factors already discussed, that is important to examine.

5) The kind of advising that prevails in CNR requires a considerable, though varying, amount of time - several hours a quarter is the norm. Therefore, the time CNR advisors are able or willing to make available is a significant consideration in addition to the quality of that time. Most CNR students and graduates felt their advisors were generous with their time. For example, *"...took time to help me with every conceivable problem a student could confront." "...I can call him anytime I have any troubles." "My advisors were available at all times..."* Thus, the data indicates that the typical CNR advisor is available and willing to take the time a given student and situation requires, and does not leave the student with the impression that his or her valuable time is being infringed upon.

A significant minority of CNR students voice concerns about their advisors' availability and the time pressures some of them seem to be under. One student comments; *"Satisfied with the interest and friendliness he shows toward me. Sorry he is so busy all the time - I feel he's overburdened* [an accurate assessment in this instance]." Or another; *"Advisor shares interest, keeps students in mind when jobs come up, etc. Only problem is he's very busy - hard to get a hold of."* In this area there is great variability from advisor to advisor, as well as between different students' experiences and perceptions of the same advisor. These differences stem not only from real variations from advisor to advisor, but also from students' divergent needs and the quality of relationship between a particular student and his or her advisor. Some students have adopted, and not inappropriately, the following strategy as expressed by one student; *"I use many of the community* [CNR] *as advisors - accessibility varies tremendously."*

In viewing this situation, where effective advising generally takes a great deal of time, some confounding factors must be noted.

The University rarely rewards advising time spent with undergraduates (i.e. in terms of it being an influential criteria for promotion or merit increase); and in the long run time spent is often punished (i.e. substantial amounts of time spent advising takes time away from research, which is the principle criteria for promotion or merit increase). The situation in CNR is further compounded by the fact that the majority of the faculty are volunteers and their contributions to CNR are typically ignored in their home department's evaluations of their work. Thus, many of the good CNR advisors, who are volunteers, knowingly and willingly, pay a stiff price both in income lost and professional advancement, in order to provide their students with what they need and deserve. This is simply a statement of acknowledged fact. Ironically, this may have a great deal to do with the fact that the overall quality of the faculty in CNR - as educators - is so high (i.e. volunteers whose commitment to a quality education is so high that they are willing to forego the usual financial and professional rewards of the University).

Summary. It should be fairly obvious that the optimal advisor-advisee relationship - "optimal" meaning the form of relationship and interaction that is most productive in enabling a student to achieve their educational, career, and life potentials - in CNR is complex and profound. This description and analysis sets the conditions that faculty and students can strive for if they choose to. Problems encountered with advising in CNR are not so much structural as they are inadequacies on the part of some advisors, and some students, in being able to achieve all aspects of an optimal advising situation. The optimal relationship has been shown to be the antithesis of the more impersonal advising relationships that prevail in most programs on campus. The strength does not lie in distant, authoritarian, or disciplinarian modes; but rather in compassion filled, relatively egalitarian relationships that are demonstrably, in this and all similar investigations in the literature, far more productive in facilitating the achievement of the University's and students' goals. Few findings in this study stand out more dramatically than this one.

The advising system in CNR is an excellent model for what other programs could choose to strive toward. It is perhaps more successful than any other undergraduate program in achieving the ideals of collegiality and a community of scholars committed to furthering democratic ideals.

In conclusion. It can be confidently stated that the advising system in CNR, though not perfect for all students, accepts a complex and difficult challenge and carries it out with unusual success for the overwhelming majority of its students. It is clearly one of the finest on campus. This system was developed and continues to evolve through ongoing collaboration between faculty, students, and staff, each with an authentic voice.

Part IV. Community and Democracy in CNR

> *"Insofar as language is impossible without thought, and language and thought is impossible without the world to which they refer, the human word is more than mere vocabulary--it is word-in-action. Learning to read and write ought to be an opportunity for men to know what speaking the word really means: a human act implying reflection and action. As such it is a primordial right and not the privilege of the few...*
>
> *Without dialogue there is no communication, and without communication there can be no true education...Dialogue cannot exist in the absence of a profound love for the world and for men. If I do not love the world--If I do not love life--If I do not love men--I cannot enter into dialogue."*
>
> *Paulo Freire*[1]

A fundamental question that is given too little attention within the University and higher education in general is: What are the optimal conditions for learning that will contribute the most toward the realization of the University's and the Nation's stated goals of furthering the ideals of a democratic society?

CNR is one of the few programs anywhere that has intentionally developed explicit structures and practices to meet this stated purpose in conjunction with its knowledge goals. The concept and the reality of the "CNR Community" address the desire to create a healthy and viable climate for learning in keeping with the democratic principles of our society. Ironically, many outside of CNR disparage the program's efforts to build a democratic learning community, invariably without systematic knowledge or analysis. Our intent here is to examine the CNR Community and its democratic structures, in all of its imperfections, and to establish how it has affected the educations, careers, and lives of CNR's students and graduates. The importance of these results is that they are real, documented, and illustrate the actual contributions of the CNR Community to its members.

Democratic participation in the governance of CNR has been central to the program since its inception. CNR was initiated in 1969 by a group of faculty and students working together in mutual collaboration. This democratic process was unequivocably

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1. *Paulo Freire is the world's most distinguished Third World educator, having provided the critical philosophical, theoretical, and practical base for the most successful literacy campaigns in history. He is the author of Pedagogy of the Oppressed and several other important works.*

endorsed by the last academic review of the major - The Messenger Report - 1974 - which states; "Student participation in the administrative committees of the program should be continued... to further formalize student participation in the administration, evaluation, and development of the major, they should be represented in the faculty panel overseeing this program, and on the Panel Committee-in-Charge" (p. 52). The Messenger Report further comments: "The utilization of students on the CNR administrative committees has been considered to be one of the valuable aspects of the program. Students have an effective and influential role to play in the affairs of the major; both they and the participating faculty feel that such formal interaction promotes a vital sense of responsibility. All agree that such an arrangement facilitates communication between students and faculty regarding the program, its management, the content of its curriculum, and its quality." The evolution of the CNR program, and the performance of its students since 1974 serves only to emphasize the soundness of the judgement rendered in the Messenger Report. The data and analyses in this study thoroughly document and substantiate this conclusion.

The "CNR Community", as any genuine community, reflects the synergistic combination of a number of tangible and intangible factors which create a particular atmosphere consciously experienced by its members. The atmosphere so created impacts virtually every member of the community regardless of their level of involvement in the planned activities of the community. The goals of the CNR Community which serve as the criteria for ongoing improvement are also its principle characteristics, however imperfectly they may be manifested in practice at times. These are: 1) an openness of communication with the pervading sense that students, faculty, and staff are working together cooperatively, caring about each other, and respecting each other as equally worthy persons; 2) full and responsible participation by all in the decisions that affect the CNR program and community; and 3) the development of social-relationships with peers, faculty, and staff that enable productive and democratic collaboration between all, including persons in positions of authority.

A few representative statements from current students and graduates will serve to evoke more of the tone these characteristics exist in: *"It was as if each faculty member and student cared about the success (and failures as learning experiences) of the others. You felt as if they were all supportive friends ('73)." "...the openness of people in CNR was the key to gaining positive results from my time at Berkeley ('79)." "I believe that respect for others is very important, especially in a learning environment. Generally I have felt respect from members of the CNR community - so wonderful after Letters and Science (current student)." "...as a student I enjoyed the 'small college' feel of CNR. It was an oasis in a large impersonal University ('78)." "Being a CNR student was participation and sharing in education, making decisions side by side with faculty, not one up, one down; and developing friendships of lasting value ('75)."*

Many significant features of CNR bring students, faculty, and staff together in formal and informal situations to work, learn, and play in an atmosphere that encourages the development of mutual trust, respect, and care among all members of the community. A number of these are listed below:

1) Students and staff are full and equal participants with faculty, within the limits set by University policy, on all committees in the program.
2) The program gathers as a whole for at least two retreats a year (usually a weekend away from campus at the beginning of the Fall Quarter, and a day-long retreat at the beginning of the Winter Quarter). These well attended gatherings assess the state of the program, clarify issues, and fashion courses of action for improvements; as well as serving for informal social interaction and relaxation together.
3) The introductory seminar (CNR 49/90) not only assists students in the conceptualization and planning of their educational program; but also through weekend retreats, group projects, and extensive time for discussion, serves to introduce and integrate new students into the CNR community and all its resources and possibilities.
4) Several other CNR classes are cooperative learning experiences with field trips, group projects, and extensive time for dialogue. Especially, CRS-101 Ecosystemology; IDS-120 Environmental Education; IDS-10 L,M,N the project sections in the "Environmental Issues" survey; CNR-198's student/faculty initiated group studies; and CNR-149 the Senior Seminar - a synthesis of the student's education.
5) The Resource Center functions as a nerve center and gathering place for the CNR community. It is where the ebb and flow of the many activities in CNR are coordinated - the major, the ongoing physical manifestation of "community". Here diverse resources, particularly human resources, come together to enhance and encourage the community of learners in CNR.
6) The CNR Student Organization is strong, active and meets regularly. It fulfills many community functions, among them the election of student members to all committees. This tends to assure that student committee members are representative and accountable; it also provides a mechanism through which the student body can keep fully informed and discuss all matters of concern to them. The organization publishes a quarterly newsletter. The CNR Student Organization is the most active and effective undergraduate program organization on campus.
7) CNR community meetings are held throughout the year as required for discussion, the development of recommendations, and other purposes.
8) CNR community social events are held periodically. These include square dances, and the now traditional gala spring dinner that brings together a couple of hundred alumni, students, faculty, and staff for an evening celebration of things accomplished.
9) Through various formal and ad hoc groups, CNR generates many events each year of educational significance for persons in CNR, for the campus as a whole, and for the Bay Area community. These include forums, symposium, film series, fairs, and much more.

10) CNR students and faculty are among the principle organizers of several groups on campus designed to extend "community" and needed services campus wide: Co-operative Connections - whose goal is to provide a co-op food store and nutrition education for the campus community; Chautauqua - a Center for Democratic Education - whose purpose is to assist students in initiating cooperative learning experiences, and to further democratic education on campus. They publish Working Papers for a Democratic Education, which lists student initiated courses each quarter along with articles; and the Ecological Design Group - whose purpose is to see UC Berkeley emerge as a center for the study of ecological design. They have published Ecolog, a catalog of resources for those interested in integrating ecological principles into their educations and lives. They publish an ecological journal Edge. Another ad hoc group of CNR and Development Studies students is publishing a journal called TELLUS - Our Common Resources under the sponsorship of a CNR faculty member, which examines environmental and resource issues throughout the world.

These activities of CNR establish the intentional and concrete efforts of the CNR student, faculty, and staff to create and maintain a democratic learning community, and to extend its benefits beyond the CNR program itself.

We will examine the impact of "community and democracy" in CNR on its students and graduates under the following sections:

1) The general quantitative and comparative data

2) Community and cooperative learning in CNR

3) Democratic structure and process in CNR

4) The understanding and relating to persons in positions of authority

5) The Resource Center

6) The CNR Student Organization

Section 1. The general quantitative and comparative data

The available questionnaire surveys of UC undergraduate programs, and UC graduates, have not directly assessed many aspects of community and democracy, either because of the rarity of the phenomena, or assumed lack of significance. The studies of CNR students and graduates have extensively examined these areas. Therefore, the available data will be presented in two groupings: A) Quantitative data where comparisons can be made between CNR and UC in general; and B) Quantitative data that is unique to CNR.

A) Data comparing CNR with other UC programs

1. Effect of competition

Undergraduates in the three Academic Review Unit's (ARU-ASUC) surveys were asked:

- I study and learn best in an environment with competition at the level such as we have here at Berkeley.

competition: Means CNR and comparisons

CNR-ARU ('79).....2.19	Life Sciences-ARU(18)....2.68
SD/D-69%; IB-6%; A/SA-25%*	All Programs-ARU(40).....2.75
Rank CNR.....2nd	SD/D-45%; IB-21%; A/SA-33%*
	(range 2.08 - 3.53)

*percentages: SD/D=Strongly Disagree(1) plus Agree(2); IB=In Between(3); A/SA=Agree(4) plus Strongly Atree(5).

2. Importance of participation in decision making

The following question was asked in the ARU-ASUC surveys:

a) The program should include undergraduates on most committees, provide an office, allow a quarterly mailing, etc., to facilitate undergraduate organizing and input.

In the 1980-1981 Survey CNR students were asked:

b) The CNR community (students, faculty, and staff) is committed to making decisions by a participatory and democratic process. Do you believe in and value this part of your education?

In the Student Initiated Questionnaire - 1976 - students were asked:

c) Is student input and representation important in the governance of CNR?

students should participate in decisions: Means CNR and comparison

a)CNR-ARU ('79).....4.59 SA/A-89%; IB-12%; D/SD-0%*	Life Sciences-ARU(18)....3.84
a)Rank CNR.....1st	All Programs-ARU(40).....3.95 SA/A-78%; IB-15%; D/SD-7%*
b)CNR-1980-81.....4.54	(range 3.48 - 4.59)
c)CNR-1976...Yes-98%; No-2%	

*percentages: SA/A=Strongly Agree(5) plus Agree(4); IB= In Between(3); D/SD=Disagree(2) plus Strongly Disagree(1)

3. Knowledge of decision making process

The following question was asked in the Life Sciences and Selected Humanities Surveys of the ARU-ASUC, but not in the Social Sciences Related Programs surveyed.

- I know a lot about the decision making processes, policies, and governance in the program.

knowledge of decision making process: Means and percentages

Life Sciences-ARU(18)....1.75
SA/A-5%; IB-10%; D/SD-85%*

All programs-ARU(26)....1.77
SA/A-5%; IB-11%; D/SD-84%*

Humanities-ARU(8).....1.81
SA/A-5%; IB-14%; D/SD-81%*

*percentages: SA/A=Strongly Agree(5) plus Agree(4); IB= In Between(3); D/SD=Disagree(2) plus Strongly Disagree(1)

4. Notification of student meetings

The following question was asked in all of the ARU-ASUC surveys:

- I have never been notified of a meeting of a general undergraduate organization in this program.

notice of meeting of student organization: Means CNR & comparisons

CNR-ARU('79).....1.28
SA/A-0%; IB-3%; D/SD-97%

Rank CNR.....39th(out of 40)

Life Sciences-ARU(18)....3.05

All programs-ARU(40).....2.62
SA/A-30%; IB-9%; D/SD-60%

(range 1.17 - 4.48)

5. Degree of participation in decision making

The following question was asked in the Life Sciences and Selected Humanities Surveys of the ARU-ASUC, but not in the Social Sciences Related Programs surveyed.

a)I have been an active member of a student organization, served on a departmental committee, attended a faculty meeting, or have been directly consulted to provide student input to this program.

The following two questions were asked of CNR students in the 1980-1981 survey:

b) Have you participated in the CNR community (attended student organization meetings, been on CNR committees, attended CNR events,etc.)?

c) Have you participated in the decision making process in CNR (student organization, committees)?

The following question was asked in the 1976 student initiated questionnaire:

d) We would like to evaluate the interest, effectiveness, and importance of student participation in the governing committees of CNR (i.e. administrative, advisor's coordinating, course planning and development). Have you attended meetings of any of these committees?

The following question was asked in the CNR Follow-Up Study:

e) Indicate your degree of involvement in the various elements (listed) of CNR related to decision making in the program.

participation in decision making: Means & percentages CNR & comparisons

b) CNR-1980-81.....2.84
Considerable-31%; Some-26%; Little or none-43%**

c) CNR-1980-81...Yes 39%/59%*
*those in CNR 4+ quarters

d) CNR-1976.....Yes 39%

e) CNR Follow-Up.....Yes 36%***
-grad from '72-'75.Yes 33%
-grad from '76-'79.Yes 42%

a) Life Sciences-ARU(18).....1.79
SA/A-8%; IB-7%; D/SD-85%

a) All programs-ARU(26).....1.87
SA/A-10%; IB-7%; D/SD-83%

a) (range 1.27 - 2.52)

**Percentages: Considerable (5 plus 4); Some(3); Little or None(2 + 1)
***responses in Follow-Up Study indicate significant involvement for at least one quarter, not simply occasional attendance.

6. Trust faculty to take students'needs and views into account

The following question was asked in all of the ARU-ASUC surveys:

-I trust the faculty to take students' needs and views into account in their decision making for the program.

trust faculty take student views into account: Means CNR & comparison

CNR-ARU('79).....3.16

Rank CNR.....8th

(range 2.30 - 3.74)

Life Sciences-ARU(18).....3.03

All programs-ARU(40).....2.96
SA/A-36%; IB-28%; D/SD-36%

Discussion of comparative data: These data reveal substantial discrepancies between what UC students value and prefer and what is, in fact, the case with respect to competition and participation in decision making in the overwhelming majority of undergraduate programs at UC.

More students believe they would study and learn better with less competition at Cal (45%), than believe the level of competition is appropriate (33%) [see question #1]. CNR encourages cooperative learning within its program. Experience with cooperative learning appears to increase the percentage of students who conclude that the general level of competition at Cal hinders their learning. In CNR where almost all students have experienced cooperative learning in some of their classes, sixty-nine percent (CNR ranked 2nd) stated that their learning was hindered by the level of competition at Cal. We can infer that actual experience with an alternative form - cooperative learning - allows students to develop a more critical understanding and analysis of the impact of the typical competitive learning atmosphere at Berkeley on their educations. As a consequence a large majority conclude that the general level of competition is a hindrance.

Students believe they should be able to participate in the decision making processes of their programs (78 percent of the respondents in the ARU-ASUC surveys - see question 2a). In those programs where students were able to participate, and where participation was extensive, an even greater percentage of students value its importance. CNR ranked first among the programs surveyed with 89 percent of its students believing it was important, and no students indicating that they did not believe students should participate in the decision making (see question #2a).

Students were woefully ignorant of the decision making processes in their programs. Eighty-four percent (84%) felt they knew little or nothing about the decision making procedures in their programs (see question #3, CNR was not included in the surveys where this question was asked). The obvious explanation is that students are not allowed or encouraged to participate. This also extends to undergraduate student associations. Thirty percent (30%) of all UC students surveyed had never been notified of an undergraduate association meeting in their programs. While every student in programs like CNR and Development Studies indicated that they had been notified about student organization meetings (see question #4, CNR ranked second), few undergraduate programs have active student organizations.

There is very little participation by students in the decision making in the vast majority of programs on campus. In the programs surveyed, eighty-three percent of the respondents had essentially not participated in the decision making in their program, including involvement in an undergraduate association. Only 10 percent indicated that they had significant participation. In sharp contrast,

CNR students were more involved in the decision making in their program than students in any other major surveyed. Thirty-nine percent (39%) of all CNR students surveyed had been involved in the program's decision making, with 59 percent of the students who had been in CNR four or more quarters having been involved. Thus, those programs like CNR that include students in their decision making, and that had active student organizations to facilitate inclusion, have a dramatically higher percentage of their students engaged in decision making relative to other programs. This clearly indicates that given the opportunity and support students will become deeply and responsibly involved in the governance of their programs (see question #5).

Students do not, on the whole, trust faculty to take their needs and views into account when decisions are made. Only 36 percent of the students surveyed trusted the faculty in this way (see question #6). This question could be answered from two antithetical perspectives by students in those programs where they participate extensively in decision making. In a democratic setting each group is free to represent themselves - students represent students, and faculty represent faculty, and together they can seek consensus. Though students in CNR trust and respect their faculty as highly as students in any program on campus (see pp. 56 - 58, and Part III Advising), they ranked eighth on this question reflecting the competing perspectives cancelling each other out. (i.e. answering from a theoretical or personal perspective).

Conclusion. A large percentage of UC students feel that the level of competition at Cal is a hindrance to their education, and believe they should be a part of the decision making process. However, most students are very ignorant of the decision making procedures in their program, and only a small number have been able or willing to participate in making the decisions that affect their education in their undergraduate programs. These facts in conjunction with the additional fact that the majority of students, as a result of their experiences, do not believe that faculty take their needs and views into account in decision making undoubtedly contributes to the cynicism and alienation found among students on campus. This hardly bodes well for the development of understanding and skills in the democratic process, or for building an informed commitment to democracy. The data also demonstrates that this condition is not inevitable. CNR and the few programs that are similar to it reveal a very different pattern. Experience with cooperative learning leads to valuing it, whereas experience with competitive learning tends to lead to alienation. The ability to participate in decision making leads to an increased valuing of participation. When students are granted substantial and authentic rights to participate they, in fact, participate extensively, if they have appropriate mechanisms and resources to facilitate it. The data from CNR sustains each of the above points, often dramatically relative to other UC programs in general. This report documents

how participation contributes immeasurably to the outstanding engagement of CNR students, on the whole, in all aspects of their education. Equally important, this experience demonstrably leads to gaining greater understanding and skills in the democratic process, and contributes to a principled commitment to democracy. The extensive data from CNR students and graduates that follows will document these conclusions in depth, as well as provide an analysis of how community and democracy functions in CNR and the resulting impacts on the educations, careers, and lives of its participants.

B) Quantitative data from CNR students and graduates

The quantitative data will be presented in full first, then integrated with the narrative data to fashion a detailed analysis and discussion of these central features of the CNR program.

CNR students responding to the 1980-1981 Survey were asked the following questions:

7) CNR strives to create a healthy and viable community where faculty, students and staff work together in a relatively egalitarian and respectful manner.

7a) Do you believe education should be carried out in this kind of community?

Mean.....4.77

(5)yes, very much so-79%; (4)19%; (3)2%; (2)0%; (1)No, not at all-0%

7b) Have you experienced and valued this community while in CNR?

Mean.....3.95/4.14*

(5)yes, very much so-35%; (4)42%; (3)13%; (2)4%; (1)No, not at all-6%

*(5)yes, very much so-48%; (4)32%; (3)11%; (2)5%; (1)No, not at all-4%

*second set of figures is for students who have been in the program for four or more quarters. This is also true for remaining questions.

7c) Have you participated in the CNR community (attended student organization meetings, been on CNR committees, attended CNR events, etc.)?

Mean.....2.84/3.36*

(5)frequently-18%; (4)13%: (3)26%; (2)24%; (1)not at all-19%
*(5)frequently-34%; (4)11%; (3)24%; (2)20%; (1)not at all-11%

8) The CNR community (students, faculty, staff) is committed to making decisions by a participatory and democratic process.

8a) Do you believe in and value this part of your education?

Mean.....4.54/4.57*

(5)yes, very much so-70%; (4)15%; (3)14%; (2)1%; (1)no, not at all-0%

*(5)yes, very much so-75%; (4)9%; (3)14%; (2)2%; (1)no, not at all-0%

8b) Have you participated in the decision making process in CNR (student organization, committees)?

Yes - 39% No - 61%

*Yes - 59% No - 41%

*second set of figures is for students who have been in the program for four or more quarters

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9) CNR encourages and facilitates students learning to communicate and to work productively together in groups.

9a) Do you feel this is an important part of your education?

Mean.....4.64/4.57*

(5)yes, very important-69%; (4)27%; (3)4%; (2)0%; (1)no, not at all-0%

*(5)yes, very important-64%; (4)29%; (3)7%; (2)0%; (1)no, not at all-0%

9b) Has working in groups in CNR helped you to communicate better and work more productively in groups?

Have not been in groups.....30%/17%*

Mean.....4.00/3.94* (for those who have been in groups)

(5)yes, very important-35%; (4)44%; (3)13%; (2)4%; (1)no, not at all-4%

*(5)yes, very important-37%; (4)40%; (3)11%; (2)3%; (1)no, not at all-9%

*second set of figures is for students who have been in the program four or more quarters

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Students responding to the Student Initiated Questionnaire (1976) were asked:

10) We would like to evaluate the interest, effectiveness, and importance of student participation in the governing committees of CNR (i.e. administrative, advisor's coordinating, course planning and development).

10a) How many times have you attended?

5+ times-3%; 4-0%; 3-8%; 2-7%; once-21%; never-61%

10b) Is student input and representation important?

Yes-98%; No-2%

Graduates in the Follow-Up Study (1980) were asked the following questions:

N.B. These questions were for the most part open-ended. Categories were readily developed from the narrative responses and coded as indicated under each question. A few of the questions were probing for complex phenomena, and hence, had a tendency to overlap and be interpreted in more than one way. Frequently respondents would write a long response under one question that encompassed several questions at once. In categorizing responses we only used those actually written in the space provided for the question being coded. Therefore, the variation in response rates to these questions is due, in part, to the respondents incorporating their response to more than one question under a specific item; and to the length of the questionnaire that led some graduates to not respond to questions that were not completely clear or straightforward. Percentages in categories are based on those who responded to the specific question in the space provided. Percentages of "no-response" are indicated.

11) An objective of CNR has always been to create a community among students, faculty, and staff. Did you experience the community and was it of value to you (while a student, later-professionally/personally)?

55%-Experienced it and valued it greatly

21%-Experienced it less substantially, but still felt it was of value

24%-Found it of little or no value

(4% of the total sample did not respond)

12) How did the relatively democratic process within the major affect the education you received?

67%-believed it had a very positive influence on their education

24%-did not believe that it had any particular influence

9%-felt it had a negative influence

(18% of the total sample did not respond)

13) How has it (the democratic process) influenced you since?

68%-Very positively

25%-No particular influence

7%-Negative influence

(34% of the total sample did not respond)

14) Graduates were queried about the amount and nature of their involvement in CNR and campus wide activities.[1]

Year of graduation	'72	'73	'74	'75	'76	'77	'78	'79	TOTAL '72-'75	TOTAL '76-'79	TOTAL '72-'79
In CNR major	N=17	N=21	N=17	N=29	N=34	N=32	N=22	N=27	N=84	N=115	N=199
Governing Committees	21%	33%	29%	14%	28%	25%	27%	26%	24%	33%	25%
Student Organization	21%	10%	12%	7%	12%	19%	45%	37%	12%	28%	20%
All CNR Activities[2]	43%	38%	29%	21%	28%	41%	50%	48%	33%	42%	36%
Campus wide Activities[3]	43%	57%	65%	41%	56%	56%	68%	59%	52%	60%	56%
Environmental and other[4]	21%	24%	41%	14%	31%	16%	36%	37%	25%	30%	28%

Key to chart on previous page:

1. Figures reported are percentages of students involved in activities for at least one quarter, not those just attending an occasional meeting.

2. Activities within CNR: administrative committee; course planning committee; advisor's coordinating committee; student organization; ad hoc committees; faculty search committees; aid for 49 class; other.

3. Campus wide activities: student government (ASUC); student organization; political groups; campus governing committees, social club/organizations; other.

4. Environmental organizations and other political groups - on and off campus.

(5% of total sample did not respond. 1971 graduates were left out because the small number of respondents would not have yielded meaningful percentages)

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15) Graduates were asked: Did CNR help you learn to communicate effectively with others and work productively with groups?

55%-A great help

21%-Moderate help

21%-No help (already knew how, etc.)

3%-Unsure

(7% of the total sample did not respond)

Discussion and analysis incorporating the narrative data

Quantitative data gives an indication of the degree to which a complex phenomenon like community, or cooperative learning, or democracy is present and the extent to which it is important and valued by students and graduates. Narrative data, on the other hand, allows us to explicate the nature of the phenomenon in any particular manifestation; especially its interpenetration with other phenomena which together constitute the whole of our concern - the impact of CNR on the educations and lives of its students and graduates. Narrative data can breathe flesh and blood into an abstract concept by rendering it in terms of persons' lived

experiences, for it was from experience that the concepts initially emerged in the past and it is to experience that they must return to be authentically understood. Thus, the quantitative data sets the broad parameters and indicates the magnitudes, while the narrative data gives us a sense of the subjective body. In this instance the narrative data is not simply illustrative, but is substantive. Therefore, narrative comments will pile one on the other with similar themes, but each with their own nuances to enrich the theme, as well as to indicate the theme's prevalence among the data, and how it merges with other themes in the actual play of life as individuals struggle to understand and express their experience.

Section 2. Community and Cooperative Learning in CNR - its nature, value, and impact

A) The CNR Community

CNR students ardently believe that their education should be carried out in a healthy and viable community where faculty, students, and staff work together in a relatively egalitarian and respectful manner. Ninety-eight percent of the CNR students responding to the 1980-1981 CNR Survey expressed this sentiment (see question #7b). Some have suggested that to ask this question is but to court the obvious. Our response to them is: "If it is so obvious, why is it such a rare phenomenon on this, and virtually all other campuses everywhere?" Given its rarity it is essential that students' position be made explicit. The whole of this study demonstrates that it is possible to develop community, as described, and all of the benefits that derive from it without sacrificing any of the traditional stated goals of the University, and to achieve some of them to a far greater degree than typical programs. So the question posed above remains - why is it so rare? We believe this question is one of fundamental importance.

Community does in fact exist in CNR, and is experienced by the overwhelming majority of CNR students. Ninety percent of the students responding to the 1980-1981 Survey had experienced and valued CNR's community to a significant degree (see question #7b). As one would expect, the "community" becomes more important as a function of the amount of time a student has been in the program. Thirty-five percent of those who had been in CNR from one to three quarters valued it very much; while 48 percent of those who had been in CNR four or more quarters valued it very much (see question 7b). Seventy-seven percent of the graduates responding to the Follow-Up Study (1980) said that they had experienced and valued the CNR community and that it had made important contributions to their careers and lives after graduation.

A substantial portion of CNR students are active participants in the organized activities of the community - the CNR Student Organization, CNR governing committees, and the diverse CNR gatherings and events. Eighty-one percent of all students responding to the 1980-1981 Survey had participated at least some; while 89 percent of those who had been in CNR a year or more had participated. Graduates had also participated significantly in the CNR community when they were students. (Thirty-three percent of those in the classes of 1972 to 1975, and 42 percent of those in the classes of 1976 to 1979. These percentages tend to indicate participation for at least a quarter, rather than occasional meetings. See question #14).

The CNR community has grown in strength and effectiveness over the years. Comparing current students' responses with those of graduates suggests that more students are experiencing, valuing, and participating in the CNR community now than in the past. The data reveals that, though graduates from the early years participated extensively in CNR, participation had fallen off markedly by 1975. Participation began to increase after 1975 and has continued to increase until it is now more extensive than it was in the early years. For example, 43 percent of the 1972 graduates had participated, 21 percent of the 1975 graduates, and 48 percent of the 1979 graduates (see question #14). In 1980-1981,we find 69 percent of the students who had been in CNR for a year or more (CNR has a five quarter residency requirement) had participated significantly, and an additional 20 percent had participated at least minimally.

Beginning in 1976 a number of improvements were instituted in CNR through the collaboration of students, faculty, and staff that have facilitated increased student involvement in all aspects of their education, including the CNR community. In 1976 the Resource Center - a center for resources and student activity - was established in its own space and staffed full-time in 1977. In the Spring of 1976 students in IDS-120, Environmental Education, undertook as a group project with faculty support, to conceptualize and create the CNR Student Organization. Prior to that time student organizing was largely ad hoc and without formal structure. The CNR Student Organization has grown rapidly since then and is presently recognized as the strongest and most effective undergraduate student association (student organizations within majors) on campus. In 1977 the Student Opportunities Coordinator position was established to, among other things, facilitate student involvement in CNR, on campus, and in the community. The valuable contributions of these additions are clearly revealed in the data in this section, and throughout this study.

CNR, unlike many new programs where enthusiasm begins to wane after their first few years, has after a low point in 1975 continued to pick up momentum, enthusiasm, and to generate improvements into the present. CNR is one of the most, if not the most, well-developed, active, and effective learning communities on campus.

The explication of the CNR community through the narrative data

1) The overall sense of the nature, value, and impact of the CNR community. The narrative responses of current students and graduates emphasize again and again the positive effect of the humane, open, cooperative, and supportive environment the CNR community provides for learning on the quality of their educations and lives. They describe a context in which people knew and cared about each other, and found it easy to engage in discussion and dialogue faculty, students, and staff about concepts, philosophies, and other mutual concerns. Questions and issues of vital import to the understanding and solving of environmental problems are continuously pursued inside and outside of the classroom, creating an intellectual climate that is rare among undergraduate programs at Berkeley. Tangible evidence of the results of this ferment can be found in a number of projects groups from CNR undertake on environmental issues - publications like TELLUS, Edge, Ecolog; organizations like Chautauqua, Cooperative Connections, Berkeley Energy Coalition, and the Coordinating Committee on Pesticides; events like Berkeley Sun Day, Berkeley Earth Day '80, and The Politics of Hunger Fair and Teach-In - to list but a few of the activities generated in whole or significant part by the CNR community. The contributions of these activities to students' knowledge and skills, and their value as preparation for further education and careers cannot be underestimated. The following narrative data captures some of the essence of the community in CNR. Comments without year of graduation after them are from current students:

> *"I have realized the potentialities of participating in such a group (i.e. richer base to draw from). It has become extremely clear to me that learning is a two way exchange. The type of community that CNR creates is of the utmost importance to create the opportunity for real learning to take place."*
>
> *"I appreciate the humanistic-decentralized cooperative attitudes present among 'authority' and 'student' peoples."*
>
> *"I think that much of what is accomplished by and within the department owes its good to the ability of members to communicate well."*
>
> *"The community 'feel'...created a positive environment and provided support ('73)."*
>
> *"Those few faculty I did know well have profoundly influenced my life. Sharing their thoughts and fears and advising as they did was probably the single most impressive aspect of the CNR major for me personally. Perhaps the fact that they felt so deeply for, about, and were involved in the major has much to do with this ('79)."*
>
> *"Yes, yes, yes [CNR community] the most important part of my total college experience ('77)."*

"Yes, the community is alive and well, it needs a wider base and a higher priority by everyone - if the atmosphere is supportive an education can be a greater experience for learning, making friends and finding how you and your personal skills best fit into our world. The community helped me tremendously, I want many others to be likewise helped ('79)."

These poignant comments capture the power of the community to extend and enrich the educational experience far beyond the limited possibilities of the classroom, as well as to minimize or eliminate the extensive alienation found among students elsewhere on campus. Of important note is the fact that community extends what students most valued in their relationships with their advisors (see Part III Advising) to relationships with many persons in the community - other students, staff, and faculty. The two are generally interactive - community and advising - and each helps to create and recreate the quality of the other, indeed the boundaries between the two are often, and appropriately, blurred.

2) Community as impetus for greater enthusiasm, motivation, exploration, and commitment. What is often overlooked in examining the quality of education, especially when it is judged almost solely on the basis of Grade Point Averages, is the nature of persons' relationships with intellectual inquiry. The CNR community creates a basis for dialogue. Critical discussion and exploration extends for untold hours outside of the classroom for large numbers of CNR students and makes substantial contributions to their ability to meet their own and the University's educational goals. This process in CNR, which is so atypical of undergraduate education at Cal, excites people and quickens their motivation to learn. The interplay of ideas and opinions contributes to students' ability to develop critical analyses, and balance well-considered understanding of complex environmental-social issues. It is the growing desire to know, the essence of a University education, that spills the discussion and debate out of the classroom and into the corridors of the community. This promotes wise and responsible action in the world beyond academia. The CNR community is an effective stimulant and receptacle for this critical phenomenon. This aspect of the CNR community is expressed in many ways:

"Yes, it [the CNR community] was what kept me interested and excited in learning: the dialogue and feedback ('75)."

"...community feeling was strong - people energized each other ('74)."

"The people I met were good people and stimulated my thinking - very informative - helped set a standard to which I could emulate my life ('76)."

"...but in general the feeling of community, camaraderie, change, and variety of people was about 50 - 75% of what kept me in college at all ('77)."

From a woman who is specializing in women's health: *"This is largely what determined the atmosphere of the University and in retrospect I appreciate its value even more. People - students, faculty, and staff - provided me with a great deal of inspiration and motivation ('77)."*

"Important political differences often break-up that sense of 'community', but such differences keep the community of interests in Environmental Problems dynamic and lively. The CNR community is strong because people are committed ('79 - currently a graduate student in development studies in the United Kingdom)."

"The people I have met have helped me question ideas and facts - how they're interpreted. Great people that I can share ideas with and discuss issues and become good friends with."

"It is important that students talk to each other about their philosophies and education, as well as vote with each other on those things they can have a say in."

A woman physician who graduated in 1974 speaks as follows; *"...It formed a supportive environment in which to develop ideas and goals and to share other people's ideas."*

Who, in the face of these comments, and the data throughout this study, can suggest that the development of a community, like that in CNR, does not make unique and substantial contributions to the students' pursuit of one of the most fundamental purposes of the University - the relentless search for truth? This is not the province of the faculty alone but of the whole University community as is so amply demonstrated in CNR.

3) Community as a base for establishing one's ground and developing a coherent vision. One of the most persistent and difficult problems many serious persons confront in their encounter with education and knowledge as presented at the University (i.e. a University education is equivalent to the sum of a finite number of discrete courses) is finding authentic meaning and purpose in their education. The CNR program and community appears to be uncommonly successful in assisting persons to ground themselves, to define a vision, and to educate themselves so they can realize that vision. This study abounds with narrative data that documents this. A few of them will be presented here:

A woman graduate (1978) who is completing a Ph.D. in Biology at UCLA expresses this not uncommon experience well: *"Yes, I did feel I was part of the community. I'd been going to school for six years* [prior to entering CNR] *and felt lost and alienated from school - the major itself made me feel I was part of the school system and this was an important stimulus for me to learn."*

From a teacher in a well-known alternative school:
"I felt secure knowing that I wasn't the only person trying to make the world better. I came to realize that my dreams are possible in the field of education ('77)."

4) The CNR community and understanding organizations and how change occurs. Being involved in the CNR community, and through it with the University as a whole, helped many students to understand organizations, bureaucracies, and how change occurs. This is important especially to CNR students because the solutions to environmental problems require change, by definition. This knowledge, anchored in experience and theory, proved very helpful after graduation. Students express this as follows:

"I believe that without this process[involvement in the CNR community] one can not expect to learn the workings by which change happens. Any course of study dealing with environmental problem solving needs to teach a process of what working with people and how to get change to occur is about."

"I see the power politics within the University, good experience and understanding to have; it sometimes is demoralizing, but this reality is needed and useful."

"I feel more comfortable discussing political aspects of life in CNR than in a more traditional setting."

5) Getting involved in the CNR community. While CNR has a strong and principled focus on community, it is important to establish that students are free to get involved or not as they choose. The CNR program seeks to inform its students that participating in the community is a viable and real option, and to build an awareness of what the potential values of getting involved are, thus creating the conditions for an informed choice. It is from this perspective that we examine the situation of some students who have found it personally difficult to get involved in the CNR community. These experiences in conjunction with the expressed intentions of several respondents to the 1980-1981 questionnaire to become involved reveals how necessary it is to offer a helping hand to all those on the edge seeking to become active participants. The data shows how important it is to be sensitive and go more than half-way in some instances to help people overcome shyness and feelings of intimidation. Sometimes in the rush of events the impression is caught by a few, however untrue in fact, that activities in the community are relatively closed but to an"in group". The CNR community, as all communities, is far from perfect, but there has been, especially on the part of the CNR Student Organization, continual effort to improve the openness and access of being part of the activities in CNR. The following narrative data will provide body for this discussion:

"I didn't experience it until I made a step to offer something to it. Prior to that, I did recognize its existence through the continual critical debate of issues, after classes, in the halls, on posters, graffiti, etc. ('79)."

"I honestly wish I felt less intimidated, but I do not. I feel that many of the people in CNR know each other, and as a consequence have formed a clique - I feel that my efforts to get involved in CNR have been stifled by both the students and the professors. The program at times created a community, but at times created an in-group a bit disdainful of other students ('75)."

The challenge of creating and maintaining community is a complex and difficult one, but an essential task in a generally democratic society. Those students who have accepted this challenge in CNR, and there are many, learn a great deal of theory and practice that contributes to their search for a more "complete" education. The issue of community is particularly important to the substantial portion of CNR's students who enter careers where they are educators and/or community organizers as part or all of their professional responsibilities, both of which are major aspects in achieving solutions to environmental problems.

6) The influence of the CNR community on those who participated minimally or not at all. The essence of community is the atmosphere it generates. We have been explicating the nature and quality of the atmosphere in the CNR community throughout this section. The climate affects those who are in its midst whether or not they are active participants. The quantitative data makes it clear that, though many students did not directly participate in the organized activities of the community, they still valued it and were influenced by its presence. For some, the limiting factor on participation was time - they had to work, care for families, or meet other responsibilities outside of school. For others, it was inherent in their nature, while for many it was simply a conscious or unconscious choice. The following comments will further clarify these points:

"Being by nature a shy person, I probably did not experience the community as directly and intensely as a more outgoing person might. I did enjoy and feel stimulated by my somewhat restrained involvement in the community. The people associated with the program definitely made the program and had a positive impact on me ('72)."

"I've so many other time commitments that I've been unable to participate - but I like the idea and hope to participate when I have a less busy quarter."

7) The continuing influence of the CNR community on people after graduation. The CNR community has continued to contribute directly and indirectly to people's careers and lives in a number of ways since they graduated. It has been an inspiration and impetus to build and participate in new communities and to generate cooperative work settings.

"Yes [value of CNR community], *I've been an active member in a natural food Co-op for three years and I feel CNR 'community' and the co-op community share in a strong desire to provide an alternative to business as usual ('72)."*

"Yes, *it* [CNR community] *was always there...you were encouraged to share with each other. In my life now, it is very clear to me if things are to work around me, then I must take the responsibility to make them work, which includes encouraging others to also take responsibility and to find what is needed and wanted and make that work* [a manager in a partially worker controlled middle sized business distributing herbal products ('75)]."

For a considerable number of graduates the CNR community has been transformed into an extended community that remains intact:

A 1975 woman graduate who is an administrator in an environmental consulting firm; "*People were the finest I have ever met - I made lifelong friends and established a network of people with similar values, goals, and concerns... This community is important...in the real world, especially large cities like the Bay Area, one finds no niche or community. Thus, it is of prime importance to establish this community feeling early, before one sinks into the abyss of disillusionment, which is so common today... CNR as a major is one of the few realistic means available these days to counteract this blanket of apathy.*"

"...*community...was very strong. I still have close contacts with several people (students and faculty) from then ('73).*"

The extended community has provided jobs for graduates, and field work, internships, and part time work for CNR students;

"Yes, *it's gotten me jobs. I've gotten jobs for others. It will always be an 'in' club for me. We shared the University together ('74).*"

Alumni frequently provide each other with resources, expertise, and support:

"Yes, *yes, while I was a student and after in work. I feel that if I ever need the CNR expertise and support it is still there. Many CNR persons are still my best of friends...we started a rafting Co-op ('75).*"

A full time consultant to the Environmental Defense Fund ('79) responds; "*Yes, I believe that the community was valuable to me as a student and shall continue to be through my life; the contact with people of like thinking and values is invaluable as a resource and support mechanism.*"

Even those who are not in direct contact with other CNR people frequently expressed a continuing bond with the CNR community:

> From a woman who is a dean at a university, and who was just nominated "woman of the year"; *"Yes, very important* [the CNR community]. *I still feel a strong connection to the major ('75)."*
>
> *"...I feel a special closeness to all who are from/in the major ('72)."*

In conclusion. The CNR community is alive and well. It is strong within the program, and continues to grow as an extended community in the lives of graduates. We have enumerated its unique and outstanding contributions to people's educations, careers, and lives. Without it CNR would be a fundamentally different program, and not nearly as effective in achieving its official mission.

B) Cooperative Learning in CNR

The power of cooperative learning and group projects is poignantly conveyed in the following fragment from the journal of an IDS-120 Environmental Education class member, written late the night before the culmination of four months of intense cooperative effort in creating the highly successful community education fair Berkeley Earth Day '80 - A Celebration of Community.

> *"May 3, 1980. 1:40 A.M. Journal Entry*
> *It's the eve of Earth Day - tomorrow is the fair which is the culmination of IDS-120's trials and successes, experience, and idealism. Working and changing along with everyone in the class has forged very special and strong bonds. Each of us puts in - our talents, concerns, enthusiasm, and guidance - what we all get out is magnified by our collective sharing. What a joy to work with a group that is so cohesive and comfortable. Where nothing is demanded of individuals, but everything of quality is expected of the group. Our group is a success; the process has been a remarkable achievement of democratic action, the fair beyond these things is only incidental..."*

In many of its classes, committees, projects and other activities, CNR encourages students to work cooperatively and productively in groups. This has long been proven an effective way to learn and frequently stimulates added enthusiasm, motivation, and purpose as we have previously indicated. The successful resolution of environmental problems invariably depends on working cooperatively within and between groups to develop focused and sophisticated collective efforts. In this situation, the democratic process is at its best.

Thus, learning and working together cooperatively reflects the eventual career setting of a large portion of CNR's graduates. Therefore, in addition to the substantive content learned and service that may be rendered through working cooperatively in groups, the knowledge and skills involved in communicating well and being productive are important academic and practical knowledge in the liberal education and career preparation of CNR students. CNR graduates tend to seek and obtain professional positions in cooperative settings much more frequently than in competitive ones (see Part VIII the Advanced Education, Careers and Lives of CNR Graduates). Learning to communicate and work productively in cooperative groups is a central aspect of being a responsible and contributing member of a democratic community like the one CNR strives to be.

1) Discussion of quantitative data. CNR students responding to the 1980-1981 Survey believed that learning to communicate and work productively in groups should be an integral part of their education. One-hundred percent believed it to be at least of some importance, and 69 percent believed that it was very important (see question #9a).

Eighty-three percent of those who had been in CNR for a year or more had worked in cooperative groups. Of those who had worked in groups 92 percent judged that the experience had contributed significantly to their ability to communicate and work productively in groups. For 35 percent it was very important (see question #9b).

Graduates in the Follow-Up Study responded in a similar manner. Seventy-six percent reported that their experience in CNR had helped them learn to communicate effectively and to work productively in groups (55 percent - a great help; 21 percent - moderate help; see question #15). A number of graduates and undergraduates indicated that they already knew how to communicate well and work productively with groups when they entered CNR.

Thus, CNR students believed learning to work in democratic groups was an important part of their education, and judged CNR to be successful in meeting their goals in this area. One only has to observe groups attempting to work cooperatively in any age group, and in any segment or level in society, to realize that good communication, cooperation, and production is not too common. There is a great deal of knowledge and skill involved that is best developed through reflected upon experience and study if democratic groups are to be successful, even when one is initially committed to working democratically. There are not many opportunities in typical educational institutions where this knowledge and experience can be gained in a context where the process is studied and reflected upon. CNR is one of the infrequent exceptions.

2) Further explication through the narrative data. CNR students and graduates were keenly aware of the differential impacts of cooperative, passive, and competitive learning situations. A 1979 graduate responds:

> "*Yes...*[classes like CNR-49 Introductory Seminar; IDS-10 Environmental Issues; CNR-149 Senior Seminar; and CNR-198's Group Independent Studies]*...are a very good and more efficient way for people to learn than the 'lecture to students' method, which has its value but doesn't develop anything beyond passivity in the student receptacles. Such classes are necessary and valid educationally, but I feel all students should be able to have good group oriented experiences, too."*

> "*Yes, group projects offer a refreshing antidote to the poison of individual competition in academia ('78).*"

> From a student in his third year at Boalt Law School: "*Yes, in particular CNR-49 and 149 were extremely beneficial collective work experiences. Additionally, most CNR classes emphasized the collective approach over the competitive one (which they go way overboard for in law school) ('77).*"

Respondents were generally sensitive to the difference between working in groups cooperatively, and working in groups individually and competitively as is the norm in heirarchically structured groups. For example;

> "...[Did you value working in groups]*...Very much - it showed me that working with a group instead of in a group individually produced better results in amount learned and the morale of the group ('75).*"

> "...*classes* [198's, CRS-110, IDS-10]*...involved group discussion, debate, and working together toward real and imaginary goals and solutions. I feel this improved my communication skills and gave me some experience in working with a group. Most other classes I'd taken although they supposedly had 'discussion' sections did not provide this experience ('79).*"

CNR students and graduates have taken their knowledge and skills in cooperative work into new situations where it has a useful role to play:

> A woman physician in family practice who graduated in 1974 comments; "*...Many physicians are very weak in communication skills and the ability to work cooperatively with others. CNR was one support along the way, helping me to develop in that area - a growth process that continues to this day.*"

A 1976 graduate who is now a community lawyer puts it this way: *"Democracy in the making of CNR activity, encouraged real communication. Most of my productivity occurred in the field. Class and discussion sections provided planning, analysis and critique."*

Learning and producing cooperatively in groups is not without problems, any more than lecture classes are always stimulating and thought provoking. An important component of the learning experience in working in groups can derive from meeting the problems encountered, seeking to analyze and understand them, and devising means to overcome them. This is not always done, nor always successful when attempted, but "failure" wisely used is a powerful learning tool. A few of the problems typically encountered are expressed as follows:

"Sometimes groups degenerate, with enthusiastic students taking on the most work, and passive students eating off the top. I had very frustrating times working in groups in CNR. I felt many times decisions and actions were allowed to be dragged out...of course group decision making is important and CNR was good at recognizing this, but so is taking initiative and acting...('79)."

It is not the intent of this study to provide an extensive analysis of the intellectual and emotional challenges faced in forming and maintaining cooperative learning and work groups; rather, our purpose has been to assess the overall magnitude and nature of their impact on people during and after their education in CNR.

In passing, it is essential to note that cooperative learning and work groups in the CNR community have undertaken many projects, far more than any other undergraduate program on campus, that have made substantial and often continuing contributions to CNR, the campus community, the Greater Bay Area, and beyond. Extensive service to the community as a principled and logical outcome of CNR's educational program is a well established tradition in CNR. These collaborative projects have made crucial and unique contributions to persons' educations, careers, and lives which are well documented throughout this study. Part VI CNR's Contributions to the Community will examine this area in greater detail.

In conclusion. We have established how learning cooperatively in groups has enabled people to gain valuable knowledge and skills in communicating and working productively in groups. These efforts have also been sources of many significant contributions to various communities, including CNR. An important aspect of these experiences that should not be underestimated in terms of its educational value, is that they provided insight into the potentials of cooperative learning as an alternative, or adjunct, to the individualistic and competitive learning that is characteristic of most classes and other formal learning situations on campus. One of CNR's objectives is to meet people as they are and to assist them to find optimal

ways to satisfy their legitimate education needs. Learning and working cooperatively in groups, which is an integral aspect of a genuine democratic community, is one important option in CNR. Virtually all CNR students are exposed to this alternative, hence they will be aware of its possibilities in an academic setting, but they are free beyond that to pursue extensive or little further work in groups. Significantly, most CNR students choose to do a substantial amount of work in groups because they find that it advances their educational goals, while at the same time is satisfying and rewarding.

Section 3. The Democratic Structure and Process in CNR - its nature, value, and impact.

"The long-standing and traditional concept of liberal education is...education for free men and women in a free society -- education in the history and culture of society, education to give people a rounded view of the world, to make them responsible for their own lives and for sharing in the responsibilities of community life, and, more generally, to fit them for useful participation as citizens of the nation and the world by enabling them to order their lives sensibly through adequate knowledge, sympathetic understanding of others, and shared moral values."[1]

Angus E. Taylor
University of California, Provost

"Liberty without equality is a thing of noble sound but squalid result."

R.H. Tawney

"We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty, and the pursuit of Happiness. - that to secure these rights, Governments are instituted among Men, deriving their just powers from the consent of the governed...all experience hath shown that mankind are more disposed to suffer, while evils are sufferable, than to right themselves by abolishing the forms to which they are accustomed."

The Declaration of Independence
of the United States, July 4, 1776

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1. Angus E. Taylor, Undergraduate Education in the University of California, Berkeley, California, 1975.

We feel it is essential at this particular juncture in the history of our society and the world to reaffirm the fundamental purposes of the University and the principles upon which our nation was founded. We are confronted with the erosion and undermining of democratic principles at home, and find our government acting to thwart the legitimate aspirations of peoples in other countries to achieve or maintain freedom and liberty. The public and scholarly tradition of our society and the world at large concretely tie freedom, liberty, and equality to democratic structures and processes which reflect the most widely shared and time tested of human aspirations (e.g. the Charter of the United Nations, The Universal Declaration of Human Rights, The Declaration of Independence, etc.). The very survival of our species may well depend on our ability to enact these principles on a world-wide basis in the relatively near future.

The sustaining and furthering of the ideals of a democratic society are a vital component of the stated purposes of the University of California. This poses an obligation for the University to continually seek more effective ways to instill and advance these ideals. Therein lies the basic reason and justification for the democratic structure and process within CNR. In the pursuit of these goals the CNR program has relied on one of the oldest and most fundamental of psychological principles known - we learn through practice and reflection on that practice. Therefore, one of the central questions of this study is, appropriately, to what extent does CNR's program achieve these goals - when examined against relative criteria, and in comparison to other U.C. programs?

The democratic quality of CNR - of, by, and for all of its members - extends beyond equity in governance, to equity and freedom in choice of courses and other learning experiences. This implies, and has tended to be the case in practice, that all are afforded equal worth, dignity, and are extended respect and trust within CNR. These conditions are rare among undergraduate programs at Berkeley. With "democracy" indicating a structure, process, and a way of being, much of the evidence and discussion already presented in this report is relevant to establishing its nature and impact in the CNR program. We will weave additional aspects of the phenomenon into the analysis in this section. In some instances this procedure may appear repetitive or self-evident; however, in view of prevailing practices in higher education, what we are attempting to develop and demonstrate here is neither obvious nor self-evident; hence, the emphasis through restatement and incorporation of new material.

A) Democracy in CNR: Review of Quantitative Data

1)Participation in decision making

a) CNR students overwhelmingly believe in and value participation in decision making as an integral part of their

education. In the 1980-1981 Survey 99 percent agreed at some level with this statement, with 70 percent giving it the highest possible rating (see question #8a). In the 1976 Student Initiated Questionaire 98 percent affirmed its value (see question #10b). In the ARU-ASUC 1979 survey, 100 percent of the CNR respondents either agreed (89 percent) or were ambivalent (11 percent) about the same question (see question #2a). In none of the surveys with a range of possible responses did any CNR student state that students should not participate in the decision making process (in the 1976 survey Yes and No were the only possible responses, with only 2 percent responding No). In all undergraduate programs (ARU-ASUC) 93 percent of the students agreed with (78 percent), or were ambivalent (15 percent) about participation in decision making (see question #2a).

Therefore, U.C. students, on the whole, believe that they should participate in the decision making in their programs. Where this is encouraged and a significant reality, like CNR, the belief in, and valuing of participation is even greater. Thus, CNR ranked first among all programs in supporting student participation in decision making in their programs (see question #2a, b, c). Thus, participation in democratic decision making enhances the already strong valuing of it held by students.

b) A large portion of CNR students do participate in the decision making in their program. In the 1980-1981 survey 59 percent of CNR students who had been in the program four or more quarters had participated in the decision making in CNR (39 percent of all respondents had participated; see question #8b). Over 30 percent of CNR's graduates have taken part in the government of the program (see question #14). Examination of the CNR data reveals that after strong student involvement in the early years there was a steady drop through 1975, with a gradual increase every year since then until current student involvement in decision making is the greatest it has ever been in the CNR program (see questions #8b, 10b, and 14). The factors relating to these shifts are discussed in the previous section on "community".

In sharp contrast, U.C. students in general are quite ignorant about the decision making processes in their programs, 84 percent indicating that they knew little or nothing about them (see question #3); and are able, or choose, to participate minimally with only 10 percent indicating that they had been involved in the decision making in their programs (see question #5a).

It is probably safe to conclude that student participation in decision making in CNR is greater than in any other undergraduate program on campus, being approximately four times greater than the campus average. Thus, creating the opportunity and developing adequate facilitating conditions, does in fact result in a large portion of the student body's participation in the governance of their program.

2) Impact of participation in decision making

a) The majority of CNR graduates responding to the 1980 Follow-Up Study reported that the democratic structure and process in the CNR program had a very positive influence in their education. Sixty-seven percent believed that it had a very positive influence, 24 percent felt it had not had any particular influence, and 9 percent felt it had a negative impact (see question #12). Graduates interpreted this question in a number of different ways. Many interpreted it as "freedom of choice" in constructing their own programs, often not distinguishing the "democratic process" from the program's "flexibility"; while another substantial group interpreted it as participation in decision making, or a combination of the two. Those who felt it had a negative impact, almost to a person, referred to a desire to have had more direction. In no instance did a graduate report that participation in the decision making of CNR had had a negative impact on their education.

b) The majority of CNR graduates reported that the democratic structure and process in CNR has continued to have an important positive influence on their lives since graduation. Sixty-eight percent reported a continued very positive influence, twenty-five percent reported no particular influence, and seven percent a negative influence (see question #13).

3) Faculty judgement. The surveys of faculty in the Messenger Report (1974), and of current faculty, overwhelmingly support the value and desirability of students' participation in the decision making in CNR; both in terms of its educational value, and its contribution to the CNR program.

In conclusion. In reviewing the quantitative data we find that democratic structures and processes are functionally present in only a few undergraduate programs, although a high percentage of all students believed it should be a part of their programs. In CNR, students highly value it, and participate extensively in the decision making in the program. CNR's graduates report that it had an important impact on their education at the time, and continues to exert a positive influence on their lives. CNR faculty attest to the value and contributions of students to the governance and development of the program.

B) Democracy in CNR: The Narrative Data

An analysis of the narrative data in conjunction with the quantitative data will illustrate the unique contributions of the democratic quality of CNR to the educations, careers, and lives of its students and graduates.

Two broad areas of impact emerge from the narrative data that explicate the value CNR's students and graduates gained from the "democracy" in CNR. 1) The authentic equity and freedom of choice

in developing one's educational program, and the responsibility associated with the freedom; and 2) The participation, as equals, in the governance of CNR. In presenting the data we will, insofar as is possible, juxtapose how persons judged this aspect of CNR's program impacted them while in CNR, with how it has continued to affect them since their graduation. Thus, we can follow the sequence of influence within individuals, and at the same time examine influences experienced by many individuals.

1) Freedom of choice and associated responsibility in a democratic setting

In these paragraphs we will build on similar narrative data and analyses presented in Part II Curriculum and Teaching, Section 2 Flexibility and Responsibility. Graduates often distinguished between mere flexibility in programs, and the flexibility with equity and freedom of choice that characterizes CNR. Focusing on the latter here will serve to illustrate how a distinction that may appear minor at first glance yields profoundly different consequences.

a) Graduates and students in CNR repeatedly emphasized that the authentic freedom of choice in CNR enabled them to gain control over and to be active participants in their educations, while at the same time teaching them to take responsibility for the choices they were making. All of this is parallel to how effective citizenship is optimally carried out in a democratic society.

The following representative reflections provide the substance and nuances for these crucial effects:

A 1972 woman graduate who was a recreation planner for the U.S. government for several years, and has recently returned to school for an advanced degree in planning, states; "[impact of democratic process at the time]...*It gave me a sense that I was in control of and responsible for my own education. It gave me a sense of participation - that education was something I could participate in rather than something that happened to me.* [Continued impact since graduation]...*It has made me feel frustrated when I am in undemocratic situations in which I have less control; e.g. in jobs I have held working for the government. In such situations I find myself committed to change and greatly motivated to make change. Also in my master's program...I have made it work for me.*"

The sense of authentic engagement, rather than passive acceptance, is constantly stressed in graduates' assessments. A physician ('74) who is completing her residency in family practice reports: "*The democracy in the program allowed me to continue to 'take charge' of my life - rather than passively consuming courses on campus. I think I might not have continued toward medicine without the motivation and perspective developed during that time period* [while in CNR].

I might have been more technical and less involved with the community approach to health without the opportunity to round out my program as an undergraduate. [impact of democracy since graduation] *As a result of those experiences, I have sponsored courses in medical school and during my residency to share a community approach to health."* CNR's ability to foster a more humanitarian approach to health is echoed by another physician ('74) who runs a rural health clinic in the southern United States: "[freedom and democracy in CNR] *Very valuable, I did not want to be an ordinary pre-med student locked into some sterile program with no relevance to anything but getting into medical school."*

The freedom in CNR allowed persons to become not only engaged in their education, but repeatedly enabled them to establish direction and meaning in their education. A young woman ('75) who is now in nursing school responds: "[value of democratic process] *I took six years to get a B.S. because I never fit in or found anything to study. I also disliked the University structure.* [after entering] *CNR due to all of the above comments,* [CNR] *enabled me to get truly involved in school.* [impact since] *I realized what kind of learning situation is best for me and that I have the right to participate actively. I am now in school again and I am involved with planning of classes and am not shy in dealing with faculty."*

The meaning of freedom with equity in practice is captured in the analysis of the following young man ('79) who is now in a graduate Architecture program at UC Berkeley: "[value of democratic process] *The advising and decision making process in the major is oriented towards asking the reasons for a students' decisions - not towards establishing a list of courses that must be taken. As far as I'm concerned, this was the single most important part of the major.* [impact since] *I felt like I graduated knowing what I had done and why, as the democratic process was such that at every turn people asked me this question. When I applied to graduate school I knew exactly what I wanted and was able to express it."* This delicate balance is caught in another way by this 1976 graduate: *"There needs to be a tension in the situation where the democratic process and experienced guidance lead us...but not either one too much."*

b) The freedom of choice and learning to take responsibility enabled many students to learn more than they would have otherwise, and often a qualitatively different kind of "knowing". It stimulated intellectual curiosity and a continued motivation to learn after graduation. A number of graduates reported that the democratic process was crucial to their learning how to learn. Thus, CNR's ability to facilitate the development of self-direction and self-motivation was important to persons at the time and continued to be a vital asset after graduation. Graduates' reflections will further explicate these influences.

A landscape architect ('77) states: *"I strongly respect the responsibility I was given to plan and take charge of my education...it was my education!* [influence of democratic process since] *I am very self-directed and responsible for my actions - and motivated to search for answers."* A 1971 graduate reports: *"I realized that the responsibility for my education was my own and that I could learn more because of that and continue*

to learn." A 1977 graduate: *"It made me push myself even harder to get the most out of my education."* A woman medical student ('77): "[value of democratic process since graduation]...*learning to go after things on my own has proved an extremely valuable skill which I feel has aided me in both professional and personal life, and will continue to do so."*

The Environmental Affairs Director for California Public Radio, a 1978 graduate, reflects: *"It* [the democratic process] *offered the hope that the value of a college education at U.C.B. could be salvaged. It gave learning at the University a human face and relevance.* [since] *I have taught at California State University, Sacramento, for two years and have applied my educational experience in CNR at C.S.U.S. with some success."* A young man ('75) with a unique position with the California State Park Service as a ranger working cross-culturally in an urban setting with inner-city youth and delinquents reports: "[democratic process]...*increased my satisfaction and intellectual curiosity within my area of interest.* [since graduation] *Reintroduced an altruistic perspective on life, job, and personal happiness. Helped lead to union organizing activities while a youth worker in Australia* [he worked with aborigines in the out-back]."

Learning how to learn was emphasized by several graduates. For example, a graduate student in Architecture ('79) responds: "[value of democratic process since graduation]...*I gained another skill which is invaluable, and that is knowing how to learn, how to take a complex subject in another field and quickly master it* [e.g. *I took twenty-five units of grad level courses* [while in CNR], *in Forestry, Business Administration, and City Planning. In each of them I came into the subject matter cold in comparison to others, and in each I did well."* Another graduate ('77) states: "[democratic process]...*Definitely distracted from my facts and figures; however, it greatly added to my political insight and knowledge, and provided a knowledge of how to obtain facts and figures when needed."*

c) Charting one's own course and assuming responsibility for it led many to continue in this vein and to frequently take on leadership roles after graduation.

A woman ('74) who is a high level biological information specialist in the U.S. Forest Service reports: *"My own initiative and interests guided me along a productive, useful course. I had a purpose, a direction and was not channelled along a pre-set direction. I'm where I am now because of my ability to set my own objectives, assume responsibility and work with others. I am more independent and tend to assume more of a leadership or managing role in life."* A young woman ('76) who is a leader in the field of recreation for the disabled states: *"This confidence of having control of decisions and being an independent thinker - allowed me to initiate programs in the community, write proposals, organize alternative kinds of programs; become a leader instead of a follower, and has given me confidence to pursue ideals and create changes for myself."* A 1979 graduate responds: "[value of democratic process] *Made me feel in charge of my education.* [since] *I don't wait for things to happen to me... I realize my responsibility and go out and seek what I need."*

The inspiration and motivation to continue directions set while in CNR has taken several forms. A 1979 graduate responds as follows: "*I feel that had the struggle to preserve the ideals of a democratic education fallen, I would not have been allowed to search so freely, I probably would have done what I could to channel my desires into one of the set 'careers' and been a bit more financially solvent, unhappy, and generally uninspired.*" A woman who is a Ph.D. candidate in Marine Studies at the University of Washington, reflects as follows: "[value democratic process]...*made me take more responsibility for what was going on...*[since] *led me to enter an interdisciplinary graduate program and take a unique direction*(Ocean Energy - oil and gas) *within this program... and proceed pretty much on my own.*" A 1973 graduate who developed and manages Almond Ranches replies: "[value democratic process] *It put me in charge of my curriculum - by my justification of that curriculum.* [since] *It made me more interested in getting an education that is of use now, and can be applied in the future.*"

d) The equity experienced in conjunction with freedom of choice and responsibility makes important contributions to people's educations. It enhanced students' feelings of dignity and worth and led them to treat others as equals, and to seek to communicate with them.

A woman who is completing a Ph.D. in Geography at UC Berkeley in international development and environmental issues phrases it as follows: "... *I appreciated being considered an equal, in some sense by my professors; and in particular the freedom and responsibility in choosing my own courses, designing my own educational strategy, was rewarding. It helped instill in me a sense of dignity and worth.* [influence of democratic process since graduation] *In my professional contacts, I still be eve in treating people as equals, irregardless of differences in age, status, experience, etc. This leads to cooperation and harmony, and tends to avoid petty jealousies and other personality roadblocks to commonly sought solutions.*"

Extended to others the feeling of equal worth contributed to sensitivity and seeing all sides of problems. For example, a 1978 graduate who is the coordinator of science programs at UC Extension reports: [influence democratic process since graduation]...*it reminded me that there are at least two, sometimes more, sides to a particular problem or concern; which in all fairness must be looked into and understood. I firmly decided to not allow emotions and an emotional appeal to take the place of a good factual position to argue a point from.*" A 1979 graduate reflects on the democratic process in CNR: "*It was a huge plus. It got me more active in teaching to others what I knew; discussing controversies with many people. Sharing ideas with them deepened my awareness of current environmental, political, philosophical, and cultural issues.* [value since] *I am capable of assuming more leadership in groups than before. I am able to emulate a democratic mode of operation that involves people more than rigidly hierarchical authority forms permit.*"

e) Finally, a potpourri of graduates' reflections about the impact of the democratic character of CNR on their educations and lives that will add to our understanding of the breadth of its influence.

A woman ('73) who is an active leader in her rural community speaks poignantly: *"The democratic process gave me the freedom to decide what was important to me to learn...we are our own best teachers.* [influence since] *I believe it is the only way to educate. Humans are capable of solving problems, teaching themselves and enjoying learning. It has made me decide to teach my son at home."* Other brief vignettes follow: *"I rebel under dictatorship type situations and of course am not open to assimilating knowledge in that state of mind (as opposed to interacting with questions) ('79)." "...it made things more fun and believable, and human - a change from the bureaucracy of the University system ('75)." "...made it easier to learn (as a result of being comfortable in school) ('72)." "I didn't have the trauma and fear most students had at Berkeley after graduating ('78)."*

2) Participation as equals in the goverance of CNR

The quality of the CNR program that emerges from the whole of this report is living testimony to the invaluable contributions of students as equal participants in the development and governance of CNR. One graduate puts it quite simply, in stating: *I believe that the opportunity for students to be involved in policy making procedures kept CNR responsive to the needs of the students ('77)."*

The focus here will be on the effect of participation on the educations and lives of individuals while in CNR and after graduation. Participation in the decision making made distinct and important contributions. Most fundamentally the solution of environmental problems ultimately requires seeking change through the democratic processes in our society. Serious experience with this process is, thus, basic to the major purposes of the CNR program.

a)Participation set a context in which people became more thoughtful about their educations, and subsequently took more responsibility for them. Students who participated developed a strong sense of belonging, education in CNR genuinely became their education as a consequence.

A medical student ('76) at UC San Francisco speaks to these interdependancies: *"...being on the Course Committee I became more thoughtful about my education and developed a sense of responsibility for it which I previously lacked. It also gave me a chance to learn about working in groups, making compromises, and developing standards for assessing ideas.* [value of participation since graduation] *I have practical experience in seeing how well democratic processes work and therefore encourage them in other activities. Also, I know better how to function in groups so that it is practical to function democratically."*

A freelance educational consultant, environmental journalist, and naturalist ('74) reflects as follows: *"The process of being involved in the Administrative Committee was an incredible education. The process of students and teachers working together made CNR an educational program rather than an institution.* [influence since graduation] *I get involved in things. Stand up for 'rights'. I push for communication..."*

b) Participation enables persons to learn how to work in democratic groups and to understand how decisions were made. As a consequence they gained important knowledge about how change occurs, and the requisite skills; which they in turn applied in their later careers and lives to the solution of environmental and other problems.

A 1978 graduate responds; *"I gained a better insight into the process by which decisions are made, and learned that my input was important.* [since graduation] *I have become more involved in environmental protection groups."* A 1981 graduate who was co-chair of the Administrative Committee states emphatically; "[that] *without this process one cannot expect to learn the workings by which change happens. Any course of study dealing with environmental problem solving needs to teach a process of what working with people and how to get change to occur is about."* A 1979 graduate: *"Helped me realize that if I wanted something out of my time I have to input into the process.* [influence since] *Now I always watch meeting dynamics and look for win/win solutions to problems."*

c) Students developed an understanding of the importance of being involved in decision making, and that change is possible if one becomes involved. Many continued to be involved in their communities after graduation.

A 1974 graduate who is a teacher of Solar Workshops at U.C. Davis Extension comments: *"I feel I was treated equally with all the other students and therefore I felt a part of the major and that I could have an effect for change by getting involved in some issues (i.e. Internship Committee).* [influence since graduation] *It has given me a sense that I can have an effect on the world at large, that I can create solutions and follow through the processes until change occurs. I just wish the world was more democratic."* Another graduate (1980) who is currently in Law School reflects: *"Prior to my experiences...I thought participatory democracy and consensual decision making were ideals one might want to strive for, but impossible to attain. I see the value of these ideals in a much clearer light. I know these ideals can be reality. We made them work."*

3) The general democratic atmosphere in CNR.

The synergistic combination of many aspects of CNR create a democratic quality that, as many students and graduates have already testified, leads to a greater knowledge of, and commitment to democratic structures and processes. This commitment has been generally carried forward into the careers and lives of CNR's graduates.

For example, a 1975 graduate who has become a Rabbi, whose Area of Interest in CNR was 'Judaism and Nature - Ecological Perspectives of Jewish Tradition', speaks of the democratic process; *"It was helpful and should continue to be encouraged.* [impact since graduation] *I teach and lead my congregation in a democratic fashion."*

The director of a division of an Oregon Community College, a 1974 woman graduate, states her position forcefully; *"I expect all systems to operate this way* [democratically], *and find myself frustrated by the power hungry...I've been harassed in my work because I voice democratic concerns."*

A member of Berkeley's Energy Commission, and a 1978 graduate, reflects; *"In retrospect, the most interesting and useful aspect of my education was learning about collective decision making."*

Graduates' commitment to democracy is caught in several nuances in the following brief statements:

"I have sought working conditions where equal consideration is given all employees ('76)."

"...am still trying democracy [in a University teaching situation]... *I have a better understanding of what sorts of questions it's apt to work on and when it does work there is nothing better ('76)."*

"It's an ideal that is strong in me and I struggle to advance it ('77)."

A soil scientist for U.S.D.A.: *"It has shown me the advantage of this approach* [democratic], *encouraging me to work to extend the democratic process and control to as many areas of society as possible ('77)."*

"...I have been spoiled [by democratic process in CNR] *and am less likely to put up with orders or plans which I feel have no reasonable substantiation. I try to incorporate a democratic process in my everyday life ('79)."*

Finally, a small number of CNR's graduates have entered the business world, certainly one of the least democratic sectors of our society. It is very instructive to note how CNR's democratic process has impacted them in the business world. The influences have varied from allowing CNR graduates an advantage in an economic growth area to democratic approaches to management.

For example, the freedom of choice in CNR allowed the owner of a growing Passive Solar Water Heating Business to *"become a leader in a new field ('77)."*

A 1978 graduate who is the manager of a large mountaineering store in Phoenix reports: "[value of democratic process after graduation] *...I believe that such open discussion is important in all tight knit groups, and I try to maintain this atmosphere with the employees who work with me now. The process* [democratic] *is really the key to maintaining a flexible system that will continue to function effectively as exterior factors change...*

Distributing responsibilities gives everyone a better understanding of problems and how to solve them."

A 1975 graduate who is part of the management of a sizeable Herbal (teas, spices, herbs, etc.) distributing business in Colorado comments: "[value of democratic process]...*it meant a lot to me.* [impact since graduation]...*at my work place I don't tell people what to do - I let them know what I need and what they need to accomplish and let them take responsibility for getting it done the way they best see fit. By the way, our morale is super high.*"

C) The Impact of the Democratic Character of CNR on Persons after they Graduate.

The narrative data in this section has been grouped principally in terms of the nature of influences experienced by persons while they were students in CNR. Therefore, it will be useful to summarize here the impact of the democratic quality of CNR on graduates' later lives. The quantitative data indicates the magnitude of this influence - over two-thirds of the graduates in the Follow-Up Study report a positive impact on their later lives; while the narrative data explicates the nature of this impact after graduation.

The effects initiated or strengthened while in CNR continue distinctively after graduation. Graduates, in part or whole as a result of their education in CNR have developed strong commitments to furthering democratic ideals in their lives.

Specifically, graduates tend to:

1) take control of, and assume responsibility for, their advanced educations, careers and lives;

2) seek, or work to create, democratic situations; and remain "engaged" in them, often assuming leadership positions;

3) translate their humanitarian ideals and senses of social responsibility into effective action in the world;

4) work for positive change through democratic means;

5) maintain a sense of dignity and worth which they extend to others.

In conclusion. The data thus demonstrates that the democratic atmosphere and experience in CNR directly leads to a large majority of CNR's graduates to pursue and realize democratic principles and practices in their later lives. Similar impacts of this magnitude stem from few, if any, other undergraduate programs. CNR DISTINCTIVELY ACHIEVES A MAJOR STATED PURPOSE OF THE UNIVERSITY OF CALIFORNIA IN THAT IT FURTHERS THE IDEALS OF OUR DEMOCRATIC SOCIETY MORE EFFECTIVELY, PERHAPS, THAN ANY OTHER PROGRAM ON CAMPUS.

Section 4. Understanding and Relating to Persons in Positions of Authority - Nature, Value and Impact.

History and contemporary events have compellingly demonstrated many times over that to be intimidated by persons in positions of authority, to accept their statements and analyses without questioning and understanding them, or to be blindly obedient to authority seriously undermines and not infrequently destroys "democracy" in practice, in any setting. In short, these all too prevalent attitudes in our society are antithetical to the effective functioning of democratic processes. Therefore, in its pursuit of democratic ideals CNR strives to assist its students to develop healthy, and whenever possible egalitarian, relationships with persons in positions of authority.

The University has given little attention to the nature of students' perceptions and relationships with persons in positions of authority on campus (e.g. professors, administrators, etc.); and what impact of these might be on students' educations, careers, and lives. The critical potential in exploring this realm became apparent in our series of evening dialogues that we held during the initial phases of this study with small groups of CNR alumni. As a consequence we chose to tap into this phenomenon in both the Follow-Up Survey and the 1980-1981 CNR Student Survey. It turned out to be a wise choice as the data that follows will demonstrate.

All of the comparative data and analyses we have presented in this report points out that only CNR and a very few other undergraduate programs on campus have striven, as a matter of principle and policy, to create an atmosphere where students and faculty work together cooperatively, recognizing each others' inherent dignity and equality of worth. This tends to yield, as we have documented in this study, to relationships characterized by mutual trust, respect, and care. We are not negating the fact that many faculty, as individuals, all across campus establish this type of relationship with their students, but rather that it is rarely a systemic characteristic of undergraduate programs. Several sources of data reported in this study show directly and indirectly that most students on campus are intimidated by, and afraid of, most of their professors and, hence, have difficulty approaching and relating to them. Furthermore, the attitudes of a substantial portion of the faculty, especially towards undergraduates, do little to alleviate this state of affairs, and often a great deal to exacerbate it. This is a statement of well documented fact. The discussions and voting in the Academic Senate over the past year (1980-1981) on the issues of student participation in Academic Senate Committees which can profoundly affect education on the Berkeley Campus, and the selection of student members of these committees, are important indicators of these faculty attitudes towards students. Relevant data can be found in this study in Part II, Section 3A - Regular Courses and Teaching, and in Part III Advising.

In a program in a professional school, like CNR, designed to enable students to understand and solve environmental problems, relationships with persons in positions of authority becomes an even more important and legitimate educational concern. Professionals seeking to solve environmental problems cannot do so without interacting with people in positions of authority in many diverse situations. The necessity to be able to accomplish this with knowledge, understanding, and without fear, is essential if a person is to be effective in carrying out his or her professional responsibilities.

These considerations have led us to consider the question: How has CNR's educational program affected people's understanding of, and attitudes toward, persons in positions of authority?

A. The quantitative data

For the majority of CNR's graduates, their educational experience in CNR significantly altered their understanding of, attitudes toward, and ability to work with, persons in positions of authority. Sixty percent of the graduates responding to the Follow-Up Study stated that CNR contributed substantially and constructively to their understanding of, attitudes toward, and ability to work effectively with persons in positions of authority (47 percent were deeply affected, and 13 percent moderately affected). Of the 34 percent who said their experience in CNR did not particularly affect their attitudes, understanding and ability to work with persons in positions of authority, the overwhelming majority stated that they felt comfortable with, and were able to work productively with people in positions of authority when they entered CNR (i.e. stated they were neither afraid of, nor intimidated by such persons). Six percent were not sure what impact, if any, their time in CNR had in this area. Thus, the remarkable finding is that at least 94 percent of CNR's graduates in the Follow-Up Study had healthy attitudes and effective working relationships with persons in positions of authority, or had made substantial progress in that direction when they graduated from CNR. Though direct comparative data are not available, all of the data in this study and that are available in the literature that bears on this important question strongly suggests that CNR students and graduates stand in marked contrast to the obsequiousness, or blind rebellion that is so prevalent among undergraduates, and which remains relatively unchanged at graduation.

B. The narrative data

The nature of CNR's effects on students' knowledge of, attitudes toward, and relationships with, persons in positions of authority are clearly explicated in the narrative data. These impacts generally flowed from the democratic structure and processes in the major, especially the kind of social-relationships between students, faculty, and staff that the

democratic climate supports and encourages. We will categorize and list these impacts and then develop each of the interdependent categories in turn.

1. People reported that they were no longer intimidated by, or uncomfortable with, persons in positions of authority as a result of their experiences in CNR.

2. People were much more able to assess persons in positions of authority on the basis of their actual competence and real merits.

3. Many people were able to view persons in positions of authority as equals (i.e. no more, no less, worthy than themselves), regardless of these persons' attitudes toward them.

4. People tended to lose their acritical acceptance of persons in positions of authority and were able to question them when it was appropriate.

5. People have been able to resolve their irrational rebellious attitudes toward all authority, and develop genuine respect where warranted for persons in positions of authority.

6. People found role models they could respect among persons in positions of authority across campus, and particularly in the CNR community.

7. CNR contributed to people's understanding of persons in positions of arbitrary authority, and an ability to work with or through them when appropriate.

1. Students and graduates reported over and over again that they were no longer intimidated by, or uncomfortable with, persons in positions of authority as a result of their experiences in CNR.

A current student states: *"I feel much more comfortable with persons in positions of authority now than I have felt before (as a result of my CNR experience). I have been able to apply this to other areas of my life - and as a result I feel much less intimidated in most situations, and am therefore more able to either make my point, question what is going on - and in general - work more effectively."* Another current student responds: *"I'm more familiar and at ease with faculty and staff. I'm less intimidated by authority and more assertive in seeking out resource people for my Area of Interest..."* A 1974 graduate reflects: *"It [CNR] helped me deal with authority more easily...since professors were accessible, helpful, and non-intimidating, which I had hoped all profs would be like so they could truly teach and guide me as an individual."*

This type of impact was not the case for just weak students, as some have maintained, but for persons across the board. For example, a 1975 graduate who has gone on to become a University Dean and was nominated for Woman of the Year, as we have already noted, states: "[Did CNR affect your attitudes toward authorities?] *Most definitely! I did an internship at Yosemite National Park and interfaced with key administrators. It helped me eliminate my fear for authority figures and allowed me to feel comfortable in working as an associate.*"

It is important to note that the flip-side of intimidation is not simply its absence. Overcoming, or freedom from, intimidation leads persons to have more confidence in themselves and in their knowledge. A woman who graduated in 1979 and is now an environmental analyst with a consulting firm expresses this very well: "*...because many of the faculty in CNR were not afraid to relate to their students as people, their students likewise were not afraid to approach them. This fosters a sense of confidence among students in dealing with people in positions of authority...something that is very important in the work world.*" A current student states, with respect to the effect of her participation in CNR on her attitudes toward authority: "*I have come to feel like what I know and have to say is important.*" From a woman ('77) who is completing a unique Ph.D. in traditional agricultural methods at U.C. Davis: "[Did CNR affect your attitude, and ability to work with people in positions of authority?] *Totally! I'm not intimidated by them at all (which has caused a few problems!). I learned to demand some respect too! My ideas and feelings are just as valid even though I don't have the extra degrees (yet!) after my name. Also those 'at the top' aren't as intimidating as those 'rising up the ladder' so I learned to just talk to whoever's in charge.*" A successful environmental journalist who graduated in 1979 replies: "*Yes...I trembled in my shoes a lot less...it made authority figures more real, more reachable. I felt more confident in my own knowledge.*"

2. As a result of their experiences in CNR, people were much more able to assess persons in positions of authority on the basis of their actual competence and real merits.

A 1974 graduate captures this when he states: "*Yes, I realized that authority figures are only experts in one or a few fields, but that they don't know everything and in fact overlook the holistic picture in many cases...I also learned how to allow authorities to be involved in my projects without letting them totally control the outcome.*" From a teacher who graduated in 1976: "*Yes, I feel somewhat resentful of people who use their status to intimidate or 'power-trip' others - I see people as being more divided by their amount of information and expertise, instead of authority.*" A young man ('73) who is a resource forester for the U.S. Forest Service comments: "*Yes, it* [CNR] *taught me to respect, but not to be in awe of people in positions of authority. Relationships between faculty and students in CNR encouraged questioning. I think it helps develop self-reliance and self-confidence and a healthy attitude toward authority.*" A 1974 graduate reflects; "*Projects and my internship forced me into such situations where I learned to respond, cope, share, and work with authorities. Most important to learn: these people* [persons in positions

of authority] *are people also.*" A 1976 graduate who holds a professional position as an educator in a large labor union: "*Definitely - for the 'worse' in terms of working in a bureaucracy because in CNR there was an atmosphere of genuine respect for people's integrity and knowledge, rather than blind respect for authority figures.*" Added perspective comes from a 1979 graduate who reports: "*Yes, the egalitarian social atmosphere helped me respect the faculty for what they knew and did much more than I could have, had it been necessary to first bow down to their status. In this way the best of contacts and friendships could be made, providing a critically supportive network. I came to respect authority based on merit and ability to lead as more important than authority based on degrees, status, and cash resources.*" Another 1979 graduate who is a free-lance artist reflects; "*I believe it* [CNR] *gave me an ability to respect true authority - meaning that which is inherent with wisdom, and also made me more able to ask correct questions to ferret out people's real areas of knowledge, unencumbered by their position or roles.*" Finally, a Ph.D. candidate at U.C. Berkeley ('73) put it quite simply: "*Yes,* [CNR] *certainly made me far more questioning of authority and respectful of competence.*"

3. The CNR experience enabled a good many people to view persons in positions of authority as equals (i.e. no greater, or no less worthy than themselves) regardless of these persons' attitudes toward them.

This point is eloquently phrased by a woman who graduated in 1973: "*Yes, because students in CNR were treated like people on the same 'level' as advisors and faculty. I left with the attitude that we're all on this earth, and in this life together, equal and I can speak to people in positions of 'authority' from that base.*" A physician who graduated in 1975 speaks: "*Yes, it* [CNR] *allowed me to realize all authority figures are human also, and just because they have more money or power than I, does not make them any more competent, intelligent, or worthy a person than I.*" A 1977 graduate who is an office manager remarks: "*The professors in the program were not on the pedestal like so many U.C. professors are. I learned that though these were persons in positions of authority, they did not treat me with disrespect - thus, I learned to work with these people on an equal footing (I lost the feelings of inferiority and fear).*"

The importance and value of being able to achieve this unilateral stance in a society that has proclaimed to the world, "We hold these truths to be self-evident, that all men [and women] are created equal..." can not be underestimated.

4. People in CNR tended to lose their acritical acceptance of persons in positions of authority and were, thus, able to question them when it was appropriate.

A teacher in an alternative school ('77) provides some perceptive insight: "*It* [CNR] *taught me to respect them if they went through the process of looking at all interests, sides, and possibilities related to a particular problem...I found many people in the corporate world* [she held a responsible position in a large corporation for two years] *wearing blinders - non-creative and refusing to accept another's argument/motivation*

and interest: very uncompromising. My belief is that public schools are responsible (beginning at an early age) for this type of close-mindedness in adulthood. In the changing world we witness today, more creativity and compromise are needed. Students need to be exposed to such things (as CNR does)..." A 1977 woman graduate who is in medical school reflects: *"...experience with faculty members, departmental committees, etc., made me much more confident than I had been...Also, it made me more likely to go after things I thought should be changed, or discussed, or whatever. It helped give me courage to act on my convictions."* Another woman medical student ('76) states: *"I learned to present my ideas clearly, to write clearly, and to be prepared to defend my ideas. This has been invaluable to me in dealing with people in positions of authority."* A current student pinpoints the effect on her attitudes: *"Participation* [in the decision making processes in the department] *has helped demystify (show the inherent human side of) people in positions of authority. It has strengthened my resolve to formulate my education and environment rather than merely be formulated by that which already exists."* A 1972 graduate states *"This* [attitude towards authority] *is a constantly developing attitude I find of terrific value as a nursing student... I believe my CNR education and exposure to attitudes of people working in the department, contributed to my desire to stand up for the positions I hold in terms of health care and my ability to do so without alienating those people already in authority."*

The following young woman ('74) who is head of a division in a community college, and currently on leave studying for an advanced degree in Great Britain with a full fellowship is very straightforward: *"Definitely!* [effect of CNR on attitudes towards authorities] *I am a straightforward speaker and have found much to my dismay that people in authority cannot deal with an articulate, attractive female whose intelligence far surpasses their own...I've been told I have no right to be as good as I am; for as young as I am."* A young man ('76) who is a California State Park Ranger responds: *"...Most important, it built up my confidence to take risks, speak out on injustices seen or experienced, and to challenge decision makers to justify their actions and include grass-roots representation when appropriate."* A recreation coordinator with the Special Services Branch of the Armed Forces who is working overseas ('77): *"Yes, I'm not afraid to speak my mind - I've grown more verbal, gained a lot of courage - people in authority I'm dealing with aren't often using their minds - mostly mouths and a lot of money."* A biological illustrator ('78) remarks: *"The education made me think twice about the validity of so called 'experts' in any field and helped me to question many things or ideas taken for granted."*

5. People in CNR have been able to resolve their irrational rebellious attitudes toward all persons in positions of authority, and to channel their energy in constructive directions. Students often find role models they can respect among the faculty in CNR.

A number of statements from current students present the raw edges of this process of transformation: *"Having always been defiant and rebellious about authority because of the attitudes, egos, and patterns of persons who supposedly have authority - I'm relieved and pleased to find role models in authority positions in CNR." "...'approachableness' of persons in authority is commendable - I'm less defensive than I used to be; less apt to*

blow up at authority figures, and far more comfortable talking to teachers, advisors, etc...." *"I have a feeling that those in charge are not just reading out information trying to weed out students. In CNR everyone can be of help - everyone must help."* *"I question authority every chance I get - thanks CNR! I feel better prepared to deal with power and authority because of the awareness CNR has given me."* A 1979 graduate responds: *"...the personal dedication and ability to relate to students is and was inspiring and rewarding to me...helped create a supportive community."*

6. Finally, CNR contributed to people's understanding of persons in positions of arbitrary authority, and to the ability to work with or through these persons when necessary.

When we remember that students in general on campus are painfully ignorant of the decision making processes in their program and on campus, the following narrative comments assume greater significance. Some current students respond: *"Through participation I have become less and less intimidated by the machine of policy, while becoming more and more aware and concerned for the well-being of the entire world ecosystem."* *"I feel I am better able to approach problems, and also people who can help deal with the problems, and maybe those who are helping the problems exist."* Graduates offer more sophisticated analyses: A 1977 graduate who is the personnel and training officer for a large public agency in the Bay Area replies: "[effect of CNR on attitudes toward and ability to work with authorities]...*CNR helped in providing experience and insights that have contributed by...anticipating their* [authorities'] *moves, knowing as much or more about their authority; and being able to contribute 'fresh' data to them - by researching issues like CNR enabled, students become better prepared because they have 'contentions'."* A 1978 graduate who owns and operates a moderate sized tree service reports: *"Yes, my CNR education increased my knowledge of social, political, and business worlds, thus, allowing me to see the basis of an authority figure's power. I now have a better understanding of where I stand in relation to people in positions of power and can adjust my actions based on that understanding."*

In conclusion. The profound impacts of the relatively egalitarian atmosphere in CNR on people's knowledge, understanding, and relationships with authority figures; and, hence, their enhanced ability to act as effective citizens in a democratic society is unequivocal. The conditions that led to these important effects are contrary to the dominant practices within the University.

The narrative data documents, in conjunction with the quantitative data, that students' relationships with authorities (faculty) in CNR was empowering. They helped lead students from acritical acceptance, or acritical rebellion, to healthy attitudes towards authority. The democracy in CNR, thus, did not lead to disrespect for authority, but rather to authentic respect where warranted, and generally to balanced and mature attitudes. Students became more confident of their own worth, and their own knowledge; and as a consequence more able to act on their convictions. Therefore, students were able to raise critical questions and explore them in discussion with faculty and others.

Threaded through the narrative data is the telling conclusion, precipitated by the factors noted above, that as a result of the egalitarian attitudes that pervade CNR - students learn more, understand in a much more complex and comprehensive fashion, and are able to apply and extend their knowledge effectively.

From a strictly academic perspective we know that most major steps forward in the search for truth and the expansion of knowledge are made, of necessity, through challenging and questioning accepted wisdom. The larger the step, the greater the resistance - down through time we are reminded of the experiences of Galileo, Darwin, Einstein, and many others. Humankind is unlikely to ever get beyond the point where new and profound truths will not emerge from questioning what is, at the time, accepted as axiomatic. Many environmental problems are the result of, and resist solution, because current conventional wisdom is rather dogmatically followed. CNR, in a manner that is rare on this or any other campus, creates an educational environment where students are encouraged and enabled to question; not only within narrowly defined limits, but to question the boundaries themselves. Nothing less is appropriate, if CNR is to advance our ability to understand and solve the immense environmental problems the world is confronted with today.

Most CNR graduates appear to understand the basic truths about the political, economic, and social roots of most environmental problems; and that these problems resist solution, in large part, because they are the consequences of one or more groups' special interest. Essential solutions must evolve from bringing new perspectives, knowledge, and understanding to currently entrenched interests. This involves continued struggle to encourage and enable all to reconceptualize them in terms of broader public interests. This entails working with, through, and often against persons in positions of authority. Authentic knowledge and understanding of the reality of 'authority', 'power', and other related aspects of our society is essential in this process (and certainly academically legitimate), along with a healthy, realistic, and non-intimidated attitude toward those in positions of authority. CNR, as a program in a professional school, has done an appropriate and credible job in this area in keeping with its accepted and stated purposes - preparing persons in a democratic society to work to understand and solve environmental problems in the public interest. CNR's students and graduates repeatedly stated that they were more committed, better prepared to work for change in the public interest, more willing to challenge arbitrary authority when appropriate, and more skilled at mastering bureaucracies to accomplish these ends, as a result of their education in CNR.

In short, CNR students and graduates are more committed and effective democratic actors in their communities - whether school, work, or home - as a result of the knowledge, understanding, and attitudes toward authority figures developed in CNR.

Section 5. The CNR Resource Center

The Resource Center is the vital hub of the CNR community. Cooperative and democratic education has a tangible manifestation in the dynamic flow of activity that continuously occurs in the center. It is the crossroads for the impressive number of individual and collective educational projects spawned in CNR. The special quality of this energizing embodiment of the CNR philosophy can not be adequately captured in a description of its physical and human resources and the specific functions it fulfills. A sense of its importance and contributions to people's educations will emerge from the quantitative and descriptive data.

The Resource Center brings students together with each other, resources, projects, the community, and jobs. The flavor is, in part, captured by the following comments from students and graduates: "... *the Resource Center is a very powerful and supportive place for students.*" "*The best thing I like about the Resource Center is the fact that it is a place for people interaction. It lives up to its name - it is indeed a Resource Center!*" A 1981 graduate who has a responsible professional position in environmental law within the legal community, and who worked as a work-study student in the Resource Center reflects on her experience there: "*I am grateful for the opportunity I had to work in the Resource Center - the contact with students, faculty, and the materials available have all added immensely to my education.*" This and additional narrative data affirms that the Resource Center is a very special place for students.

The Resource Center, which was not fully established until 1976-1977, is physically small, about the size of a faculty office - in fact it is a converted office. The following resources are contained within it:

1. Library Resources. A select library of books, pamphlets, and magazines focused on environmental issues. Also assistance in locating printed resources on the rest of campus, and throughout the Bay Area.

2. Field Placement Files. A continuously updated file of several hundred organizations, both public and private, and the nature of various opportunities within them (i.e. for short-term field work (197's) and internships (180's). In conjunction with this index, and cross-referenced, is over 300 extensive "Internship Reports", which provides critical insight and analyses of most of the internships CNR students have undertaken over the years.

3. Community and Volunteer Opportunities. Current information and advice on many new and on-going projects and diverse opportunities in surrounding communities, of interest to CNR students.

4. Career and Job Information and Assistance. Contains files with information about careers and jobs of interest to CNR students and graduates, including a listing of current positions held by several hundred CNR graduates. The Resource Center receives and

posts job announcements, many that come by word of mouth, from many diverse sources. The alumni network has been an especially good contributor to this resource.

5. Alumni Network. The CNR alumni are particularly active in maintaining a continuing affiliation with CNR. The Resource Center has current addresses and information for more than 700 of CNR's 1,000 graduates. Graduates and students alike draw on this resource to make contacts, locate hard to find resources and data, and for other useful information. This has been an excellent source for internships, part-time jobs, and full-time jobs for graduates.

6. Assistance in seeking funding sources and in the preparation of various kinds of intra- and extra- mural grant applications. An active file of potential funding sources and their requirements is available. As we have already noted, CNR students receive more grants for their educational projects than any other undergraduate program on campus.

7. Assistance in creating educational projects within CNR and in the community. The Resource Center provides technical help, support, and contacts for students seeking to develop every conceivable sort of project.

8. Technical assistance and headquarters for the CNR Student Organization. The resources and materials relevant to the Student Organization are concentrated in the Resource Center, along with an individual mailbox for each CNR student. It further serves as an office space for the many activities of the Student Organization.

9. Student Papers. There is an extensive collection of select student papers from several CNR courses that serve as additional reference materials.

Staff. The Resource Center has two part-time staff persons.

1. A Coordinator of the Resource Center. This person currently works four days a week and is principally responsible for the overall coordination of the center. Specifically, this person is responsible for the collection of materials, circulation, being a reference/resource person, and many other important functions that do not fit neatly into a job description.

2. A Student Opportunities Coordinator. This person works half-time and is responsible for, among other things: developing and assisting students in finding opportunities for involvement in the community; assisting students in locating, and applying for, intra- and extra-mural grants for educational and research projects; building and maintaining job and career resources; the alumni network; assisting in the organization and development of the CNR community and its programs (e.g. fall retreats, career forums, annual dinners, technical assistance to the Student Organization, etc.).

It is obvious that both of these positions are, optimally, highly creative ones requiring many talents. CNR has been very fortunate in being able to attract truly outstanding persons to fill these crucial slots over the years. Without them the Resource Center would not be the exceptional place that it is.

Students' Assessments of the Resource Center

The following questions were asked in the 1980-1981 Student Survey:

CNR Resource Center: The Resource Center aspires to provide many printed and human resources (e.g. books, pamphlets, community placement options, job referrals, reference assistance...and other diverse kinds of help) through the Resource Center Coordinator, and the Student Opportunities Coordinator.

1) Do you feel the Resource Center is important?

Mean = 4.65/4.66* (five point scale)

5)yes, very much so-73%; 4)21%; 3)4%; 2)2%; 1)No, not at all-0%
*5)yes, very much so-76%; 4)17%; 3)5%; 2)2%; 1)No, not at all-0%

*Students who have been in the CNR major four or more quarters

2) Have you, or do you plan, to make use of the Resource Center?

Mean = 4.12/4.24*

5)yes, extensive use-37%; 4)45%; 3)13%; 2)4%; 1)No use at all-1%
*5)yes, extensive use-65%; 4)29%; 3)4%; 2)2%; 1)No use at all-0%

*Students who have been in the CNR major four or more quarters

3) What aspects of the Resource Center have been useful to you? Double-check those that have been most useful to you.
(97 students responded to this question: 54 had been in CNR 1 - 3 quarters; and 43 four or more quarters)

-Books/Pamphlets.....64 (51/13)*
-Field Placement files.....28 (24/4)*
-Community and volunteer opportunities.....32 (22/10)*
-Job/Career information.....35 (30/5)*
-Student papers.....38 (33/5)*
-Student information.....55 (40/15)*
(mailboxes, student organization, etc.)
-Other reference material.....57 (42/15)*

*First figure in parentheses is the number of times single checked, the second number is the number of times double checked.

Discussion. It is unmistakable that students place a high value on their Resource Center, and make extensive use of its many physical and human resources. Not surprisingly, the longer students are in the major, the more useful it is to them. No student who had been in the program for over a year had not used, or did not plan to use, the Resource Center, with only 2 percent making, or planning, relatively little use of the center. Ninety-four percent of the students rated the Resource Center as very valuable, with 73 percent rating it as high as possible. In brief, the Resource Center has proven to be an effective "resource" for the overwhelming majority of CNR students.

Analysis. The quality of the Resource Center ultimately resides in what staff, students, and faculty have created, and continue to create, in its confined space. It has a life of its own anchored in people's attitudes about it, what they expect from it, and what they continually recreate within it. The quality is not a function of a static repository of materials but of the milieu generated and maintained by all. However, the staff play a vital role in building and maintaining its motivating and supportive atmosphere. Large numbers of students in the 1980-1981 Survey spontaneously praised the special merits of the staff persons in the center. For example: "[the Resource Center]...*is always there when needed, always a friendly face to greet you, always someone ready to help.*" "*Nothing about the Resource Center has given me a problem, the helpful _____ and _____, all work for a great place for the CNR student.*"

The Resource Center is the communications center for students within CNR, and between CNR and the larger University and Bay Area communities. It is the place where many educational and community projects are germinated and move toward fruition. Students state: "*Support, a comfortable center for people...the cohesiveness of the CNR major depends on the communication opportunities provided by the center.*" "*The most effective and enjoyable work done in the Resource Center is done through group effort....*"

Reaching outward, the Resource Center has become an effective link with the larger community, especially CNR alumni. Students who undertake field work, internships, and other community projects make extensive use of field placement files and internship reports, as well as the human resources that congregate in the center. Students and alumni often find part-time and full-time jobs and careers through the resources and connections facilitated by the center. Alumni, through this connection, have made jobs available for each other, for new graduates, and for students. No good data is available about the full extent of this highly important function because most of the connections flow through persons, rather than official printed announcements. However, it is extensive and serves substantial numbers of students and alumni every year, and continues to grow as more and more persons take advantage of its potentials. One student phrases the outreach aspect as follows: "...*the Resource Center fulfills a major role in providing a network connecting us with the community. This is a good way*

for us to provide routes to taking a lead in the 'environmental movement'. More resources - staff, funding, and space should help us fill this role more adequately."

The Resource Center has been a dynamic source for individuals and groups in facilitating the development and realization of a rich array of educational projects, most of which made substantial contributions to communities locally and around the world (e.g. while this report is being written there are students currently engaged in projects in China, Israel, Zambia, and Columbia). The Resource Center has been especially helpful in assisting students to gain financial support for their projects. Students, typically in many modest sized grants, on the average aggregate about 50,000 dollars a year in support from various sources as has been noted in detail elsewhere in this report (see Part II, Section 5 - Grants and Awards). This amount alone significantly exceeds the yearly operating costs of the Resource Center

Recommendations from students. In keeping with the value they place on the services provided by the Resource Center a large portion of the respondents to the 1980-1981 Survey spontaneously recommended that the Center should have more space, be opened more hours (particularly some weekend and evening hours), and that the staff positions in the Center be permanently funded.

In conclusion. We have, briefly but emphatically, documented the essential and unique contributions the Resource Center makes to the cooperative and democratic learning community in CNR. These in turn have impacted the educations, careers, and lives of CNR's students and graduates in important ways. The impact of the Center demonstrably extends far beyond what one would expect from the statements of its function, and the job descriptions of its staff.

Section 6. The CNR Student Organization

The CNR Student Organization has been judged by the Academic Affairs Office of the ASUC and others as the most effective and successful undergraduate program organization on campus and held up as a model for others to emulate. In tangible and intangible ways it gives a coherence and focus for the student body which would otherwise not be present. The sense of belonging and collectivity that it engenders is a crucial aspect of the CNR community and education in CNR. Typically students in programs are fragmented and act individually or in ad hoc groups without a strong sense of responsibility to, or belonging to, the whole. An organization must do more than merely exist to fulfill the purpose the CNR Student Organization does. It has to emerge and develop in such a way that students can identify with it and see their interests reflected in its operation before it can become a genuine collective expression of a group. The CNR Student Organization has achieved this and that is the central source of its power and effectiveness.

We offer this brief description and analysis of the CNR Student Organization because it was created and is maintained by students with faculty and staff support. An essential part of judging the impact of educational experiences on people's lives is to examine what they create as students, whether academic papers or organizations, against the criteria derived from a program's and the University's stated aims and purposes.

The Origins of the CNR Student Organization. The origins are not only interesting and instructive in their own right, but are equally important for understanding the nature of CNR's success, for the origins of the student organization are archetypal. Many features of CNR have evolved in the same way - from the community of faculty, students and staff in response to an experienced need, rather than being introduced from above through a heirarchical chain.

The seeds of success of the CNR Student Organization can be found in the way it was activated, and by analogy the success of the CNR program as a whole. The Spring 1977 IDS-120 class became concerned with the issue of "social responsibility" in their lives, and as a consequence decided to undertake a community project. After considerable systematic discussion, the need for a strong student organization - to improve the CNR program which itself is an environmental education program - emerged as the most important contribution the group could make consistent with its resources and the course's purposes. An obvious, but rarely activated concept underlying this is that 'environmental education' was not presented as something outside of the students' own educational experience, but something that was integral to it. In CNR, students have been encouraged and enabled to see the process and structure of their education as both an area of concern, and an area in which they can participate as equals to continuously reformulate and refine the program as a whole and for themselves individually. Hence, "education" is a part of education, not outside of it as is typically the case.

Much time was spent in analyzing the relative failure of student organizations in CNR in the past, and in other undergraduate programs. Time was similarly spent in explicating the nature of the need for such an organization and the type of functions it could fulfill. In this process a large number of the members in the CNR community were consulted at length. The analysis and understanding that flowed from this was used as a basis for an extensive discussion of a structure for the organization. How could it best be structured to reflect the democratic principles of the major? What would assure its maintenance in the short run, and over time? How could the likelihood of extensive student involvement be maximized? From this discussion a structure was evolved which is presented below. The group then developed the necessary plan for action to fully implement the CNR Student Organization by the Fall of 1977. That is, they delineated the tasks that had to be accomplished and persons committed themselves to completing them by that time.

Thus, a problem and need was felt by a group - their need for a strong collective voice - and time was apportioned to thoroughly explore it; a critical analysis and understanding of the situation was generated; a solution was created from this analysis consistent with CNR's principles; and the solution was implemented in practice to be modified in light of experience with practice. The process followed above is directly analogous to one of the most effective means of realizing the basic purpose of the CNR major - the identification, understanding, and solution of environmental problems.

Discussion of the Archetypal quality of the above process. One is constantly amazed by how much has been accomplished in CNR, especially with a completely volunteer faculty until the last few years, and even now there are only four faculty officially assigned to the CRS Department. This study demonstrates how what has been accomplished is in large part the result of the collegiality and equity that exists in CNR. Thus, any member of the community, or group of members - faculty, students, and staff or any combination thereof - can initiate a contribution to the program and bring it in front of the community for consideration. They can continue to follow through and be an equal member of the group that ultimately takes responsibility for implementing the new or changed element in practice. Thus, students, faculty, and staff together tend to be more motivated and committed to playing initiating roles and taking the time and investing the effort required to bring an idea to fruition. It is by this internal process, rather than from above, that much of what contributes to making CNR the outstanding program that it is,has been created and maintained. The energies of the whole community have been frequently brought to bear on improving the quality of the CNR program. Each group within the community contributing their unique concerns and perspectives, reaching together for common solutions, and sharing in the responsibility for implementing and maintaining accepted resolutions. This has encompassed everything from course development to the Annual Spring Dinner. Without these collaborative efforts and genuine sharing of responsibility, much of what constitutes CNR would not be. Thus, democracy in CNR has not only been important at a principled and educational level, but it has also been responsible for generating and maintaining many of the excellent features of the program.

The Nature of the CNR Student Organization

The description that follows has been adapted from the organization's own documents, especially The CNR Student Handbook which was initiated by students and realized as a collaborative community effort.

Purpose: "CNR students have formalized their voice through the CNR Student Organization. The organization is recognized by the CNR Faculty Panel as the official body of CNR students. It provides a base from which students manifest and maintain the CNR philosophy in practice. The structure of the organization

is designed to pursue its purpose through a participatory democracy of which all CNR students are members. All students have an equal voice and an opportunity to exercise that voice in considering and acting on common concerns, both inside and outside of the University."

"The organization aims to keep the entire CNR community abreast of developments within CNR and the wider community, in order to guarantee, facilitate, and encourage commmunication. This insures an information flow that will allow students to fully participate in the enactment and implementation of decisions affecting their educations and lives." (from the CNR Student Handbook)

Structure:

Decisions. All substantive decisions are made by the membership as a whole at regular bi-monthly meetings or, when required, special meetings. The organization encourages all of its members to become involved so that the organization may truly reflect and support the rich diversity that is CNR.

Coordination. To facilitate the smooth functioning of and maintenance of the organization there is a group of coordinators. Anyone who has an interest in and commitment to the coordinating function may be a member of the coordinating group. Though anyone may be a member, to insure the viability of the coordinating group, six of the members will be elected from the CNR student community, their election insuring a strong public commitment to the role of coordination.

Meetings. The meetings are open to all members of the community - students, faculty, and staff - to both attend and participate in the discussion.

Functions:

Committees: CNR, College, and University. Where possible the organization elects its representatives to campus committees; where not, it nominates and submits nominations to the responsible bodies. Members of committees are the representatives of the students and thus, are responsible and accountable to the CNR student body through the student organization.

Forum to discuss issues, develop positions, and take actions on issues of common concern. Where appropriate this forum is used to inform and guide student representatives to standing and ad hoc committees on campus so that they can represent the consensus of the student body. For example, the Student Organization has frequently developed criteria, reflecting their interests, to be used by student members of search committees for new faculty and staff.

To Sponsor, facilitate, and support projects and events. The organization has initiated events for the CNR and wider

community, been a co-sponsor for many more, and provided a wide array of support for diverse projects and events that have come out of the University. It is one of the first places students come when they want advice and help in undertaking projects or initiating events. This ranges all the way from social events within the major - square dances, halloween parties, etc.- to symposium, career forums, and film series; to major community projects - Sun Day, Berkeley Earth Day '80, and Berkeley Energy Self-Reliance Year. The CNR Student Organization has played an active role in helping other groups of students on campus to organization and achieve their purposes.

To Publish the CNR Review. This quarterly newsletter is written and distributed by CNR students. It serves as an opinion forum for students, to facilitate communication within CNR, and to publicize information and events.

Discussion and Conclusion.

The purpose of this brief section is not to thoroughly describe and document the contributions of the CNR Student Organization, but rather to establish its critical role in contributing to and maintaining the CNR community. This part (Part IV) of the report has been investigating and documenting the impact of the CNR community on people's lives, while in the major and after graduation. The impact of CNR on people's lives is after all the central theme of this whole study.

From this perspective, the student organization is a secure collective base from which students can interact with other sub-groups in the CNR community in a representative, as well as in an individual, fashion. This provides parallel structures in the community - faculty can and do meet as faculty, students can and do meet as students, and their representatives can then come together in the program's decision making bodies having considered the issues before them with their peers (i.e. the administrative committee, course planning and development committee, etc.). Thus, the structures that allow for the prevalent attitude in CNR of collaborative effort to be realized in practice are present. Though there are often differences within CNR on issues and their resolution; rarely, if ever, have they broken along sub-group lines (e.g. students taking one position, and faculty or staff another). Thus, rather than playing adversarial roles, students, faculty and staff principally reach decisions through dialogue striving for collaborative and consensual resolutions.

This model, however imperfectly it is practiced at times, intentionally underlies the program. Students are, therefore, a part of an ongoing coherent structure and effort to realize the best of democratic principles in practice at every point of their education within CNR. This consistency in purpose and exercise of democracy is responsible for the participatory community atmosphere and the continuous exposure to these principles. It is just this emersion, and the imperative to

constantly reflect on practice, that provides the extended experience in working with and for authentic democratic modes that yields the impressive effects on people's lives we have described and documented in this report.

The CNR Student Organization is consistent with, and continuous with, the overall structure and process of the CNR program. Most other student program associations are, in part or whole, externally linked as an appendage rather than as an integral element of their program. Section 1 of this part (Part IV) of the report establishes the growing and extensive participation of CNR students in their organization. For students, it has become a major focal point for identification with, and participation in, the CNR community.

Further Analysis and Conclusions: Part IV Community and Democracy

The conscious development of a democratic learning community in CNR with appropriate structures and modest, but effective, support services is quite unique among undergraduate programs at Berkeley. We have thoroughly documented the existence of such a learning community and the important impacts it has had on persons while they were students and after they graduated. CNR has, thus, contributed in essential ways to one of the University's principal stated aims - furthering the democratic ideals of our nation. In the process, as this report authenticates, the learning atmosphere has been important in enabling students to more fully realize their own and other educational goals of the University. The CNR community in achieving these results taps into a much broader range of students' potentials and talents than is true for the typical undergraduate program at Berkeley.

Collegiality exists among the members of the CNR community - faculty, students, and staff. Reviewing Part II - Curriculum and Teaching, Part III - Advising, and Part IV will verify the extent of its presence and its powerful effects on students. This is an ideal that is often spoken about at the University but seldom achieved to any significant degree. The much discussed Muscatine Report, for example, states:

> *"...What will our students have in common? Our answer is ideally they will have in common the exposure to a noble stance, both scientific and humane, that will be exemplified in the conduct of every one of us. It is not, then, what we teach that will give final validity to education at Berkeley, but what we are."* 3

The problem with this prescription at Berkeley is tellingly pointed out by Martin Trow, Director of the Center for the Study of Higher Education, and currently chairman of the Academic Senate,

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3. *Education at Berkeley: Report of the Select Committee on Education, Academic Senate, University of California, Berkeley, 1966 (p. 6).*

in an article where he notes in response to the above paragraph from the Muscatine Report:

> *"...institutionalized constraints, whether of colleges or faculty committees or perhaps even departments, only hinder and obscure the personal individual qualities of the faculty that 'give final validity to education at Berkeley.'"*
>
> *"The difficulty is that academic men, as a group, are no more noble than anyone else...And it is certainly true that one of the consequences of the remoteness of most regular faculty from undergraduates, and especially from lower division students, is to deprive them of the experience of close association with men who can manifest those personal virtues in their learning and scholarship. The various efforts at Berkeley to 'bring faculty and students more closely together' outside the curriculum fail both because the association thus engendered is superficial, and because it divorces the man's personal qualities from his demonstration of them in his scholarly life."* [4]

What CNR demonstrates is, that though it is probably impossible to achieve collegiality for Berkeley as a whole, it is possible to achieve it within a program, and that the primary constraints are human, not institutional. It can be created if there is an intentional choice both to seek it, and to adopt the structures and processes that maximize the potential for its development. The associations typically engendered by the community, advising system, and democratic structures in CNR are substantial, well rounded, and not superficial, as is verified in this study.

The community that exists in CNR has been an effective antidote to the apathy, alienation, individualism, and growing narcissism in our society and among students on the Berkeley campus, which is eroding the democratic and moral fabric of our society. Christopher Lasch provides a broad, if imperfect, overview of this complex phenomenon in his book The Culture of Narcissism: American Life in the Age of Diminishing Expectations.[5] In speaking about this issue and referring to his own research on the mores of white middle class Americans, Robert Bellah, professor of sociology and comparative studies at U.C. Berkeley, describes the situation:

> *"We live in a social system that tells us, not just verbally but in the daily practice of life, that we are alone, that we are here to pursue our own interests, that neither anyone nor anything can save us except ourselves. It tells us that we must mistrust every noble impulse we feel because it must be only a form of our own self-seeking..."*
>
> *"What is striking is that we are discovering a private world of great intensity and no content whatsoever. There is a vehement*

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4. Martin Trow, Bell, Book, and Berkeley, Experiment and Innovation: New Directions in Education at the University of California, Vol. 1, No. 2, January 1968 (pp 10-11)
5. Christopher Lasch, The Culture of Narcissism: American Life in the Age of Diminishing Expectations, (N.Y.: W.W. Norton & Co., 1978).

insistence on selfhood but it is an absolutely empty self; except for the sheer quantity of excitation there is nothing there at all."[6]

To deny the substantial truth of these and many other scholarly analyses revealing the same veins is to miss the forest in our preoccupation with a few trees. We need to sit back, at times, and cast a penetrating glance at the general status of our fellow citizens. Further, not to reflect on and examine our educational institutions' possible contributions to this malaise is irresponsible behavior on the part of educators entrusted with our nation's youth. That the educational environment in CNR appears to significantly reverse these tendencies for a large portion of its students should give us pause when we consider the impact and meaning of the general educational environment at Berkeley, and at other universities, with respect to these phenomena. The presence and nature of "community" in CNR, and all that makes for its intangible, yet real, substance, is one key to understanding what is possible in countering this drift that is tending toward an avalanche in our society.

In creating a cooperative and community learning atmosphere dedicated to understanding and solving environmental problems in the public interest, CNR has spawned an incredible array of cooperative and individual learning projects, inside and outside of classrooms, that have reflected sound social concern. These have in turn made substantial contributions to the to the University and larger community. Part V of this report - CNR's Contributions to the Community - considers this aspect of the program in some detail.

The crucial insight provided by the CNR experience, that we need to be continuously reminded of, is that to learn to value and work democratically and collectively is a challenge that requires focused and sustained intellectual and emotional attention, with ongoing critical reflection. CNR provides this experience in a context where it has genuine meaning and important consequences for the students and the program. This report documents the fact that not only do students value this process but that their knowledge, understanding, and commitment to democratic structures and processes is markedly increased by their immersion in it. The democratic ideal is allowed to take concrete and complex form in practice that can be grappled with by the "whole" person. The consequences of this while in CNR and in later life are substantial and frequently dramatic.

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6. *Robert N. Bellah, Cultural Vision and the Human Future, Teachers College Record, Vol. 82, No. 3, Spring 1981 (pp497-506). This issue of Teachers College Record is a report on a symposium "Knowledge, Education, and Human Values" sponsored by Teachers College, Columbia University and the C.F. Kettering Foundation. It brought together over 50 prominent academics, businessmen, government officials, and others representing a range of human endeavor to consider the "relation between education in the broadest sense and those dimensions of experience that give value, meaning, and purpose to human life."*

This is associated with a significant reduction, if not elimination, of apathy, alienation, and empty individualism in a large portion of CNR's students. Persons may come into CNR with democratic and community predispositions, though students across campus place a high value on democratic participation as well, but the data unequivocally show that CNR plays a vital role in the transformation of these concerns into effective understanding, practice, and commitment. This demonstrates the impact that the milieu of a university education has on its nature and on its effect on people's lives. Consequently students in CNR manifest a high level of social concern and responsibility both while they are in CNR and after they graduate, as this report thoroughly documents.

A remarkable finding of this study is, that despite dire prognostications about its impossibility at Berkeley, CNR has created the structures, processes, and atmosphere which allow the realization of many of the traditional goals of a liberal education and recommendations of the Muscatine Report.[7] Furthermore, in spite of many external impediments, this context continues to grow in form, strength, and effectiveness as is verified throughout this study. It is not a transient phenomenon but one that has been evolving, and continues to slowly evolve as the result of continuous evaluation and development by faculty, students, and staff.

This part of the report - Part IV Community and Democracy in CNR - has illustrated the interpenetration of "community" in CNR with all aspects of its educational program. The democratic community which is cared for and emergent from the roots, rather than imposed from above, is the profoundly significant milieu within which education exists in CNR. Education and community are, in fact, inseparable for its students - that is the nature of its existence. To rend them asunder is to dismantle the democratic learning community while maintaining the courses, as many outside of the program advocate and have at times attempted to implement. This action would destroy a large part of what constitutes the quality and educational value of CNR and which leads as we have extensively documented, to CNR's outstanding success in achieving the educational goals of its students, the University and society as a whole. The "CNR community" contributes immeasurably to those essential qualities deeply valued by virtually every CNR student and graduate - an education that is humane, where persons are granted their inherent dignity and worthiness in an atmosphere characterized by trust, respect, and care.

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7. *For a written expression of predictions see Martin Trow's critique of the Muscatine Report (op. cit.).*

Part V. CNR students' contributions to the Community [1]

One of the fundamental aims of a university education, particularly one with a liberal education emphasis, has always been to promote social responsibility and the development of skills that are useful in the community. This in turn is one means through which a university education can further the ideals of our democratic society. Angus Taylor, while a Provost of the University of California in 1975, phrased it as follows:

> *"...to make them [students] responsible for their own lives and for sharing in the responsibilities of community life, and more generally, to fit them for useful participation as citizens of the nation and the world..."* [2]

CNR students rated "developing social responsibility and useful community skills" as very important goals in their education, and CNR ranked first among all campus programs surveyed by the Academic Review Unit-ASUC (40-plus programs) in the degree to which programs met student goals in this area (see Selected Educational Goals, pp. 14-18 of this report). The CNR program emphasizes, as one of its key educational components, "practical experience in the community" as a means for students to hone their critical analytical skills, and for the purpose of enabling them to construct authentic syntheses between theory and practice. These are essential accomplishments if students are to be effective in identifying, understanding, and solving environmental problems; to learn to be socially responsible and develop skills of value in the community. It is important to emphasize that these are not tangental aims of a university education, but aims that have been put forward historically and contemporarily as central goals.

One time tested, and obvious way, to assess whether or not a program is achieving its purposes is to examine what students have done, while students, relative to a particular goal. The best predictors of future "works" in an area have always been present "works" in the same area. Thus, in the same manner that present grades are the best predictors of future grades, present contributions to the community (i.e. instances of taking social responsibility and developing useful community skills) are the best predictors of future contributions to the community. This conclusion, which is upheld in the relevant educational and psychological literature, is also the case in this specific instance when we examine the later lives of CNR's graduates in Part VIII of this report.

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1. *The graphics in this Part of the report, unless otherwise noted, were all taken from CNR projects. They capture the serious, yet joyful, tenor of their work, as well as the quality they have strived to achieve.*
2. *Angus E. Taylor, Undergraduate Education in the University of California, University of California, Berkeley, December 1975 (page 7).*

Therefore, it is both important and appropriate to judge the impact of CNR on the lives of its students, with respect to the goals of promoting social responsibility and the development of useful community skills, and furthering the ideals of a democratic society, in terms of their "works" in the community, undertaken as students.

An overview of what will emerge in this section will provide a frame of reference from which to consider the material that follows.

1. CNR students, individually and collectively, have made greater contributions to their many communities - CNR, University, Berkeley, and wider communities - by a substantial margin than any other undergraduate program on campus.

2. CNR students have made the overwhelming majority of their contributions through collective and democratic means, working directly with people in their communities at the "grass roots" level. In many instances they have contributed as elected or appointed representatives of their communities - student community, Berkeley community, etc. Thus, they have, in commendable ways, brought their commitment to the democratic ideals of our society into their work in the community.

3. CNR students have, typically, initiated and created their own projects and then, when appropriate, moved into coalition with other community groups on the local, state, and national levels, as full partners, in order to realize their goals more effectively. That is, CNR students have rarely made their contributions in isolation from others working for the same ends. This exemplifies the collaborative and collective thrust that characterizes CNR, and which is so essential for progress in a democratic society.

4. CNR students have often been the seminal influence in the conceptualization and realization of new organizations and projects in the community as members of groups which from the outset included substantial numbers of persons from outside of the CNR community. In this manner, CNR students have extended their knowledge, skills, and democratic values to a much wider sphere. That is, CNR students have taken what they have learned in CNR and shared it with others freely and broadly to the benefit of all.

5. The contributions we will focus on were all, either principally initiated by students with faculty and staff support, consultation, and often direct involvement; or initiated as genuine collaborative efforts with faculty and staff from their outset through their realization. That is, none of these projects were initiated by faculty or staff with the later recruitment of students as workers to help carry them out. This is an important distinction in understanding the impacts on students that accrue from these experiences.

Section 1. CNR Students' Contributions to the University Community

A dominant condition among students at U.C. is a lack of identification with, and responsibility toward, the University Community as contributing members to its maintenance and growth. This is in part the result of the expectations of students projected by the University; given the minimal role afforded students in the governance of most departments and in University affairs in general, and the attitudes held by most faculty, and many administrators about full student participation in decisions; and in part a function of students' own previous experience, attitudes, and senses of responsibility. Witness: the low rate of participation of students in the decision making processes in their departments, the small number of active undergraduate student associations, the small portion of the whole who apply for potential appointments to academic senate committees and chancellor's advisory committees, the relatively small turnout for ASUC elections, etc. This hardly augurs well for future participation in the polity. CNR students on the whole, once again, stand out in marked contrast to the general student population at Berkeley.

A) CNR Students' Contributions to CNR

The enormous contributions of CNR students to the CNR program and community have been extensively described and documented in Part IV - Community and Democracy in CNR. We will simply repeat here that CNR students' contributions to their program probably exceed those of students in any other program on campus, starting with CNR's origins in a joint student-faculty effort. In the most basic sense - CNR students, faculty, and staff are the CNR program - to change this relationship would fundamentally alter the program.

B) CNR Students' Contributions to the Wider Campus Community

The diversity and extent of CNR students' contributions to the campus community are manifold. The listing below is selective; we are not even aware of the full extent of CNR students' involvements. Except in a few instances we will only list contributions made during the past two academic years, particularly those during the 1980-1981 academic year.

1. Chancellor's Advisory Committees

Search Committee for Professional Schools' Provost
(one CNR student member 1980-1981)

Student Health Service Advisory Committee
(one CNR student member 1980-1981)

2. Academic Senate Committees

Committee on Educational Policy
(one CNR graduate, now a graduate student 1980-1981)

Committee on Courses
(one CNR student 1980-1981)

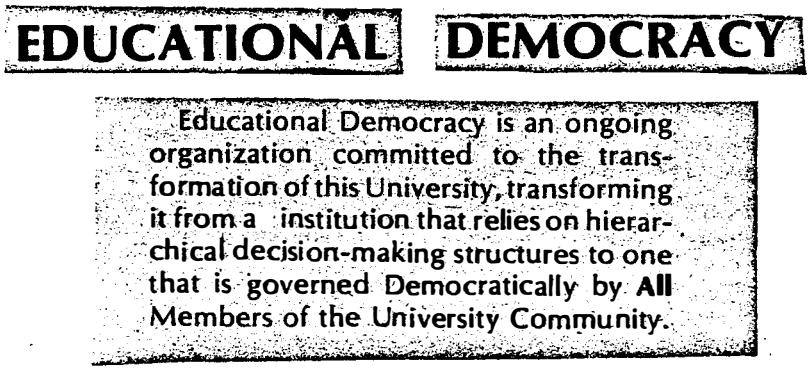
3. Board of Directors or Coordinating Committees of University Affiliated Organizations

U.C. Office of Appropriate Technology. A CNR student is currently a member of the governing body of U.C.A.T., and CNR students have been members almost continuously since its inception. CNR students have received a number of grants from U.C.A.T.

CAL-PIRG. A CNR student is currently a member of the Board of Directors of the California Public Interest Research Group in Berkeley. Over the years since its inception, CNR students have frequently been members of CAL-PIRG's Board of Directors, staff members, and actively engaged in many of their projects.

4. Associated Students of the University of California (ASUC)

CNR students have been active in the U.C. student association over the years. Recently, for example, in the Winter and Spring of 1980 a group of students, principally from CNR, became concerned about the deteriorating quality of the democratic process in the ASUC Senate, and consequently chose to try and improve it. They reenergized a campus political party - Educational Democracy - and a number of CNR students and a CNR graduate ran for elected office. Educational Democracy swept the Executive Offices and gained several Senate seats. As a result the democratic process was greatly improved and the atmosphere became more civilized.



a. Elected Officers of the ASUC

Academic Affairs Vice-President 1980-1981 (a CNR graduate)

ASUC Senators (1980-1981 one CNR student; 1981-1982 one CNR student)

b. Staff Positions. Two CNR students held key staff positions in the ASUC Office of Academic Affairs; and one CNR student worked in the Student Advocate's Office on campus health and safety and women's issues.

5. Organizations affiliated with the ASUC

CNR students have played major roles in the conceptualization, establishment, and development of three important new ASUC affiliated student service organizations that have been established during 1980 and 1981. Cooperative Connections, a student food cooperative, and Chautauqua - A Center for Democratic Education, to facilitate and coordinate student initiated classes, began as project sections in a CNR 198, Education for Democratic Action in the Fall of 1980. A third, the ASUC-Berkeley Draft Counseling Center was initiated by student peace activists and its first co-directors were a CNR student and a Development Studies student who was a graduate of IDS-120 Environmental Education, one of CNR's year-long core courses.

Each of these growing organizations has chosen to work collectively with a participatory democratic structure, using a consensual decision making process. These choices evolved from the initiators' experiences in CNR classes and the CNR community. Struggling to effect collective and consensual practices is a basic effort on the part of these people to "further" the quality of democratic practices in our society, by working to enact the implications of democracy's "root" principles into practice. Because each of these organizations have many CNR students as active members of their collectives, and because they reflect so well CNR's intent, in terms of practical experience and social responsibility, we will describe them in some detail. They reflect, in our opinion, significant and creative contributions to the campus community.

a. 

Cooperative Connections, beginning with about 15 students in the Fall of 1980, has expanded to over 30 active collective members, with a complex committee structure. They have a functioning food buying club of nearly 100 members, and hold inexpensive community lunches for all every Friday. Currently they are independently incorporated, have leased space from the ASUC in the Student Union, and have sought and received a $16,000 fund from the U.C. Regents to renovate their space into a CO-OP FOOD STORE. They are the first student food co-op in the Student Union complex. We will let them describe themselves in their own words as quoted from SPECS - Student Perspectives on Education and Courses, Spring 1981, page 29-30 (a publication of the Academic Affairs Office of the ASUC that CNR students and graduates have played a substantial role in):

"Greetings! We would like to be your cooperative connection. We are a group of people who have come together in a student-initiated class to learn how to learn in a democratic way about food. The common thread that links us together is our recognition of the great need for alternatives to the present food system in this country. By applying our knowledge about food, cooperatives, and nutrition, to building a food cooperative in the ASUC union we have seen an alternative blossom before our eyes. It has been a powerful and exciting experience, and we are now seeking to share that experience with others by opening up channels for participation.

"Over the past weeks and months, we have laid the foundations of a food buying club that will enable participants to purchase wholesome food at significant savings (15% - 30%). A food buying club is, essentially, a group of people pooling their food needs into a single order, thus being able to buy directly from wholesalers. We want to provide quality food goods; food that is free from unnecessary additives, and, whenever possible, produce grown without chemicals or pesticides.

"Belonging to a food buying club entails certain responsibilities, for while Cooperative Connections plays a part in coordination and bookkeeping, the success of the club depends upon the active participation of its members. By sharing the work no one will ever have to work too hard or often, and we can learn together all the facets of food buying, transporting, and distribution. We haven't felt that distributions have been 'chores' or 'burdens'. By taking an active part in meeting our own food needs they have become enjoyable and empowering experiences.

"As we have spent time directly involved with providing a need so essential to our existence, we have come to realize how easy it is to take food for granted. Rather than continue in the mode of unconscious consumption, we have tried to reawaken ourselves to the blessing of food, and to the joy that can come from sharing food with friends. In this light, our regular Friday lunches will serve as a time when our community can gather to meet and appreciate each other in a comfortable and nourishing environment.

"If you are interested in finding out more about what we are doing or want to become part of it (which could mean anything from ordering food and working a few hours a month on distribution to devoting a solid chunk of time and energy) please talk to any member of Cooperative Connections. We're ready and waiting to connect.

Cooperative Connections has become a dynamic collective group which has engaged in an often difficult struggle to learn how to work cooperatively and consensually - obviously they are succeeding. In the process they have learned a tremendous amount about one critical and complex environmentally related issue - FOOD. Not only have they had to develop extensive knowledge about food and nutritional issues, agricultural politics, distribution, marketing, and starting a cooperative business; but they have sought democratic and humane solutions to these problems and are working to implement them in practice. Furthermore, as a part of their program, they are seeking to educate the campus community about food issues -

both those who join their food buying club, and the campus community at large through events like their highly successful "Orange Week" this past Spring. As a result, several of these students have defined their Area of Interest in CNR as food-related topics so their academic work is fully integrated with their community work. Thus, this group, initiated in a CNR class principally by CNR students, has been, and continues to be, an outstanding educational experience - academically and experientially - and has at the same time made creative and valuable contributions to the campus community.

b. Chautauqua

Chautauqua's origins were also in a CNR-198 in the Fall of 1980, with prominent CNR student involvement, in response to growing student desire across campus to gain a greater measure of control over their education - to be responsible for their own lives, being one of the fundamental aims of a liberal education. By Spring 1981 Chautauqua had an office in Eshleman Hall; was publishing a magazine/catalogue, Chautauqua - Working Papers for a Democratic Education which presented its purposes and resources and listed about 25 student-initiated classes that it was sponsoring and/or coordinating. In addition, Chautauqua had sponsored a number of community events including bi-weekly gatherings to discuss the theoretical and practical issues of concern; and a symposium with outstanding democratic educators like Mike Clark, the director of Highlander Research and Education Center in Tennessee. In June 1981 they gained approval as an "ASUC Operation" from the student Senate and were funded, with staff positions and resources, for the 1980-1981 year. The description of the purpose of the Center below is drawn from Working Papers for a Democratic Education:

> "We believe that the fundamental challenge of humankind is to seek liberation, dignity, and a humane life for all. Therefore, we believe that the basic purpose of education is to further the achievement of these goals.
>
> "Our educational institutions have demonstrated their inability to further the realization of important aspects of these goals. For instance, large numbers of people in our country and the world do not have access to sufficient food, clothing, shelter, health care, and education.

"We believe that the fundamental principles that should form a basis of a society striving toward these goals are freedom, liberty, equality, justice, and community. These interdependent principles need to be reinvested with those meanings and implications which reflect the finest aspirations of humankind as expressed, for example, in The Universal Declaration of Human Rights of the United Nations. We believe these principles should underlie the structure and process of all societal institutions, including education.

"Therefore, we are creating 'Chautauqua - A Center for Democratic Education' in response to the crucial need to implement these principles in our educational experience. We wish to learn how to learn, and act, democratically both within the University and within the larger community. The Center will be structured horizontally with decisions made by consensus, because we feel it is the best reflection of the principles we value.

"Our education can thus, be born of the creative tension between how life is lived and how life might be lived in a free society."

Why 'Democratic Education'?

"Chautauqua was established to promote democratic education. Democratic education is not a formula, but an expression of our goal to expand the freedom and participation of all learning members of an educational process. The purpose of Chautauqua is to facilitate a process where students can create an education that reflects their values and meets their needs. This purpose is fairly simple, but it can be fulfilled in a great many ways.

"One aspect of promoting democratic education is to provide access to resources. Our intent is to provide tools of the educational craft. We have files on how to initiate courses, helpful professors and departments, funding sources, and other resources which can help you take a more active role in creating your education. We are also hoping to bring together the various groups on campus who are exploring these types of alternatives. Perhaps our greatest resource is each other; by sharing our ideas and experiences, we can all come to a better understanding of how to make the most of our educational opportunities.

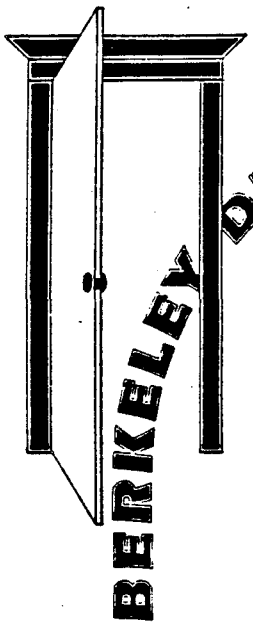
"Democratic education can also be manifested in class content, structure, and process. In bringing together all of our ideas about how these classes can be most effective, we can help each other build toward an increasingly useful and hopeful education. To the extent that it is helpful, we would like to offer our resources and experience with democratic education. We would also like to communicate with you in order to develop ourselves as a responsive, effective group which can grow in its ability to assist this kind of education. We have ideas about how to make education more open and dynamic at all levels, but they aren't useful until we share them, play with them, and develop them to meet all of our needs. Together, we'd like to come to a mutual understanding of what those needs are, and how best to fulfill them. That's what democratic education is about.

"Some of the functions we hope to fulfill are:

- to build a community which will bring us together physically and spiritually through periodic community gatherings and collective efforts.
- to create a place where democratic activity, as we have described, can be encouraged and coordinated.
- to facilitate and initiate democratic classes, and to provide resources and encouragement for others to do the same.
- to assist students in forming powerful and democratic organizations, especially departmental student organizations.
- to sponsor educational events that further our knowledge and practice of democratic education and action."

One of the essential components of the solution to environmental problems in the public interest in a democratic society is public education at all levels. A considerable number of CNR's graduates enter professional positions where all, or a large part of their time, is spent as educators. Our current dominant modes of education have not prevented the emergence of environmental problems that could have been avoided. The requisite knowledge was available long before problems developed, for example, land and water problems in the American West - see John Wesley Powell's Report on the Lands of the Arid Region (1878), compiled while he was the Director of U.S.G.S. for analyses and solutions still pertinent to this day. Nor has our educational system enabled us to solve these dilemmas in due speed when technical and other aspects of a just and appropriate solution are available. Therefore, it is not surprising that many CNR students with interest in education have been exploring alternative educational philosophies and methods that are consistent with their maturing environmental ethics; while mindful of the great educational task ahead of them if environmental problems are to be resolved or averted, in the public interest. Characteristic of the CNR community, when they find something of value, they have sought to disseminate it in their communities. CNR students have probably implemented more successful student-initiated classes, and in other ways gained

substantial control over their educations, than any other group of students on campus. Thus, they have joined with other students with similar experiences in Chautauqua to share their knowledge, understanding, and skills with the rest of the campus community. Certainly, judging from the number of classes they are already providing support and assistance for, they are meeting a real need and contributing a unique service to the campus community. In the process they are learning much of value in an academic and professional sense that will be important in their future educations and careers, not the least of which is the "empowerment" resulting from creating a solution to an existing need in a large and bureaucratic institution.



COUNSELING CENTER 642-0165
asuc 300c eshleman hall uc berkeley 94720

The Berkeley Draft Counseling Center was initiated and shepherded through the ASUC Senate to become an ASUC Operation in the Spring of 1980, in response to the renewed call for a draft and draft registration, by students active in the peace movement on campus. The first co-directors of the Center, who were largely responsible for shaping the program in collaboration with some 30 members of the Center's collective, were a CNR student, and a Development Studies student who was a graduate of one of CNR's year-long courses- IDS 120-Environmental Education.

CNR's principle contribution to the Draft Counseling Center, besides the two co-directors, was the underlying educational model of the Center, both in terms of the participatory democratic structure with a consensual decision making process of the Center's staff, and the principle operating model of its educational programs. We note that CNR is not a sponsor of the Center, nor is the Center in the usual sense directed toward the solution of environmental problems. The educational model is best stated in the co-director's own words:

> "...as a policy, we provide no pat answers or packaged suggestions. Instead we offer information and educational materials as tools to employ in making an individual decision about serving in the military. Through counseling, draft age men realize the liberating idea that the decision is completely theirs. We encourage counselees to be in control, probably for the first time, of their own lives by making responsible choices. Evening 'Registration Education Programs' which were held during the massive draft registration weeks in the summer and the winter were based on these concepts of educating for responsible independent choice...
>
> "This process, which _____ refers to as 'empowerment' is conveyed through our counseling and through every project the Center

takes on. Empowerment occurs when a person realizes that they can have an effect on the world. Empowerment, too, is an infectious idea..."

The Draft Counseling Center illustrates that what is learned in CNR has wider direct and important applications than the solution of environmental problems - a significant aim of a liberal education is thus exemplified in practice. This demonstrates that education in CNR yields more than just narrow instrumental applications in a specific field, but in this instance, a coherent democratic educational model, in sharp contrast to education in general at Berkeley.[3] The Center, itself, has been very successful and has been widely praised around the country. It has reached, literally, thousands of young people and helped them to educate themselves through its many and diverse programs. In the Bay Area it has been a critical force in bringing together divergent constituencies to work together cooperatively (e.g. the campus, the city and surrounding communities, the school district, and working class groups). The Center, or more precisely its effects, have gained nationwide attention for its successful effort in initiating and moving the Berkeley School Board to vote to include Draft Education as a mandated part of the High School Curriculum. The Center is an active participant in creating the actual curriculum and supporting materials - a significant and ground breaking first in the nation. Once more, a principled action flows from the fundamental notion that citizens in a democratic society have a "right" and a "need" to be fully informed in order to make wise choices at all points of their lives, in this instance a potentially life or death choice not to be made lightly. In concluding, CNR students have made substantial and principled contributions to the campus and wider community through the Draft Counseling Center whose form they played a major role in determining.

6. Established projects of the ASUC

SPECS - Student Perspectives on Education and Courses

The Academic Affairs Office of the ASUC has for many years published student evaluations of courses as a service to students, through funding from the Council on Educational Development. In 1980-1981 the publication (formerly "Primer") was revitalized with the addition of thought provoking articles and more creative graphic design. The purpose of SPECS is:

3."Berkeley, as an institution, has no conception of the educated man, nor any plan for liberal education...it may be somewhat more fruitful to turn to the institutional conditions that help explain both the absence of educational philosophy (beyond laissez faire) and the lack of interest in having one at Berkeley." Martin Trow, Bell, Book, and Berkeley, Experiment and Innovation: New Directions in Education at the University of California, Vol. 1, No. 2, January 1968 (pp.7 & 11).

"Every book has a purpose. Ours is three-fold. One, to serve as a practical guide for planning and choosing educational options at Berkeley. Two, to offer perspectives and directions in education. And three, to provide students with resources to aid them in both University and community life.

"Beyond the practical aspects of the book, we hope to offer alternatives to students who want more out of their education. To this extent, our perspectives on education will be apparent in the articles, reviews, and graphics of this book." (SPECS-Fall-Winter 1981: p.1).

CNR students and graduates have as part of the SPECS collective played important roles in the editorial, production, writing, and data collection aspects of this large undertaking during 1980 and 1981. This contributes substantially to a valuable resource for the U.C. student community.

7. Other Campus Organizations and On-Going Projects

CNR students have reached out, joined, and collaborated with students across campus to create organizations and sustained projects of benefit to the campus community.

a. Ecological Design Group

The Ecological Design Group is an organization of students centered in the College of Environmental Design. One of the two primary initiators of this group was a CNR student, and a number of CNR students are part of the group. CNR has also provided support and collaboration through other student groups in which CNR students are centrally involved - the CNR Student Organization, Chautauqua, and Cooperative Connections.

Their founding perspective: "Ecological Design is a conscious effort to plan and build human communities as harmonious parts of the environment. The need for ecological design is based on the recognition that all human activities are part of the greater ecological system, and that these activities can push the ecology out of balance - the balance that provides us with everything necessary for our survival.

"Ecological design uses ecological models, both stable and unstable, as guides for the design of sustainable solutions to human problems.

"In the past our constructions have unintentionally altered our ecology in ways that are becoming increasingly unpleasant.

"Ecological design is intentional ecology.

"Ecological design can include not only traditional design fields such as architecture and engineering, but any area of planning which considers ecological principles in its pursuit of a healthy environment."

-Ecological Design Group-
August 1980
(Ecolog 1980-1981, p.11)

The Ecological Design Group has accomplished the following things since its founding in 1980:

- the publication of ECOLOG (Fall 1980), a beautifully designed and professionally produced "catalog of resources for the U.C. Berkeley student who is interested in integrating ecological principles and values into his/her life and education. The Ecological Design Group produced Ecolog in an attempt to create a network of U.C. students, faculty, and members of the Berkeley community whose interests center on building an ecological future. It is our desire that U.C. Berkeley emerge as a center for the study of ecological design." (from Ecolog)

- the publication of EDGE (Spring 1981), a journal with articles featuring actual working solutions to environmental problems, organizations, and other available resources. From Edge's statement of purpose:

"With EDGE we are trying to make connections in several ways.

"Academically, we seek to creatively dissolve the artificial separations of educational disciplines.

"Politically, we are attempting to show that all progressive social concerns, including those of feminists, minorities, and environmentalists, have the same basic idea at their core - how to live more freely in a healthy and supportive environment.

"Geographically, we seek to illustrate the interdependence of our lives with people around the globe, and to share the experiences of those whose dreams and struggles parallel our own.

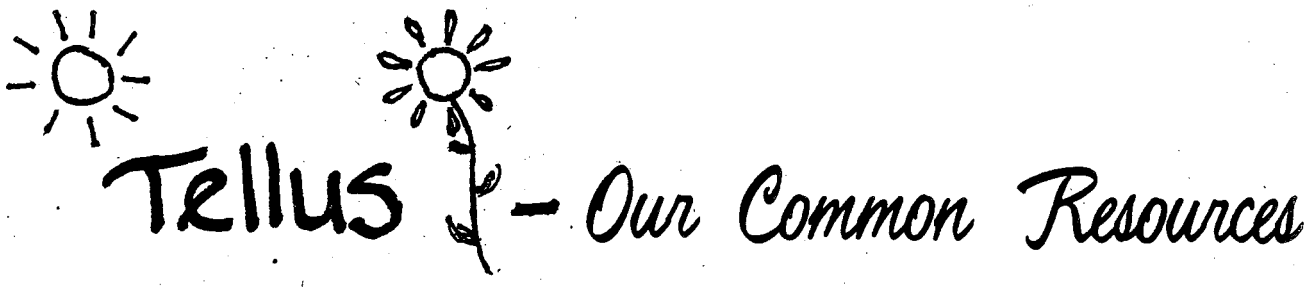
"Pragmatically, our efforts are aimed at connecting people with the resources and individuals with whom they can more fully realize their ambitions. We are especially interested in connecting the vast educational potential of the University with the experience and diverse cultural resources of the Berkeley community." (from Edge, Spring 1981; pp. 2-3)

- established the Ecological Design and Resource Center in Wurster Hall. The center houses a pertinent library and other resources and services as an information clearing house for events, jobs, and outside resources.

- significant progress has been made in establishing a major in Ecological Design in the College of Environmental Design incorporating many of the strengths of the CNR major.

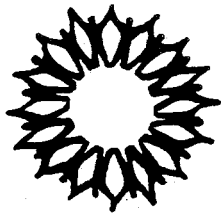
- held events, speaker series, etc.

The Ecological Design Group is an outstanding example of CNR students bringing their understanding, knowledge, and experience without selfish proprietory interest, and joining with others to create new centers that express their concerns and values. This is an example of how the democratic quality and values of CNR spread and grow from the "root" to sprout in another fertile setting; thus, organically widening the community that shares its educational and societal philosophy, and environmental concerns.



b. Tellus - Our Common Resources (vol.1, No.1,Spring 1981; Vol.2, No.2, Summer 1981) is an environmental magazine of, by, and for students. Several of its primary initiators were CNR students, who gathered together with others under the auspices of a CNR-198 and the guidance of a CNR faculty member. The group includes, in addition to students from CNR, students from Development Studies, Political Science, Economics, Political Economy of Industrial Societies, and History. They secured funding from many sources (the initial grant was written by a CNR student); wrote the articles, did the layout and production work, and distributed the result - a professionally produced journal.

Tellus reflects yet another excellent example of combining solid academic work (the articles are well researched, documented, and probe issues in considerable depth) with practical experience, while at the same time yielding a product and service which can reach far beyond their own group and contribute to the education of the campus and the larger public.



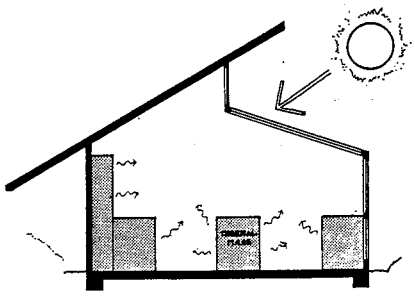
c. Oxford Tract Solar Greenhouse Project

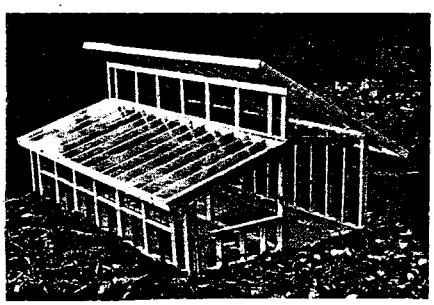
"The Oxford Tract Solar Greenhouse Project seems to be radiating energy that is creating a favorable growing environment for student experience in the processes of planning, design, and construction of a solar structure...the first solar structure on the Berkeley Campus (CNR Review, Spring 1981)."

The project was conceived by a former CNR student and current CNR staff member and was designed, sited, and constructed as a collective effort of over 40 members of the CNR community as a joint project of CRS-101 Urban Garden Ecosystems and a CNR-198 Section (supervised group independent study). An example of having to master sufficient information and theory to translate it into concrete practice - students had to understand solar theory and design sufficiently enough to assess the relative merits of several design options against efficiency, cost, and other variables; master University and City permission and permit bureaucracies; gain the support of the surrounding Berkeley neighborhood; solicit effective funding; locate new and recyclable materials; and learn the necessary construction skills. In the process students accumulated a great deal of knowledge, tapped extensive resources, especially human resources, and learned the persistence and patience so critical to success of projects of this scale.

The dedication and "greenhouse warming celebration" on June 3, 1981 drew over 100 people to champagne and a pot-luck lunch, including a Berkeley City Council Member, and the Chair of the Berkeley Energy Commission as speakers. The greenhouse, which is wheelchair accessible, is seen as a contribution to a self-reliant community and a part of Berkeley's Energy Self-Reliance Year.

The solar greenhouse that contributed so much to many persons' educations will remain as a teaching resource, particularly for CRS-101 Urban Garden Ecosystems, and as a demonstration site for people in the Bay Area interested in appropriate technology. The solar greenhouse is a tangible and lasting gift from CNR to the campus and Berkeley communities.





Stuart Hartley

d. Agent Orange Veteran's Advisory Committee (ADVAC). CNR students and staff collaborated in organizing the campus section of this group as well as the parent group in 1979-1980. ADVAC is a local group of veterans, community members, lawyers, educators, and students. The main goals of the Committee are: 1. to reach Vietnam Vets who may have been exposed to Agent Orange while in Vietnam; 2. to help those Vets to obtain medical care and counseling; 3. to inform the community at large of the dangers of the continued use of herbicides and pesticides; 4. to pressure the federal government and the Veteran's Administration to stop the use of these toxic chemicals and to accept responsibility for the treatment of those who were affected by their exposure to the herbicide.

This group sought to locate all the Vietnam Veterans on campus, and in the Bay Area, to alert them to potential health effects if they had been exposed to Agent Orange in Vietnam; and sponsored symposia, film showings, and discussions on campus in an effort to educate the campus community on this issue. This is an instance where CNR students, staff, and faculty shared their expertise (knowledge about phenoxy herbicides and pesticides - their composition, use, and effects) with the public, especially Vietnam Veterans, so they might be informed about a serious and important environmental and health problem. In this manner they assisted citizens to exercise their rights in our society responsibly and wisely, and to seek justice.

e. Friends of the River on Campus. CNR students organized a campus chapter of Friends of the River, an organization devoted to preserving some free-flowing stretches of Western rivers, particularly in California (1979 - 1980).

f. Association for the Preservation of Alaska's Wildlands. CNR students organized a compus-wide group to work in coalition with the nation-wide Alaska Coalition to educate and activate the campus community with respect to the pending Alaska Lands Act before Congress. The group presented a number of campus events in conjunction with its organizing work (1979-1980).

8. Campus Events for the University and Wider Community

a. Politics of World Hunger - Fair and Teach-In (Spring 1980)

CNR students in coalition with the UNITAS Hunger Action Center (whose director was a CNR graduate) organized and ran a day-long series of events on campus to educate the campus and Berkeley community on food and hunger issues.

There was a large fair on lower Sproul Plaza with booths, displays, activities, and music that brought together dozens of campus and Bay Area groups that work with food and hunger issues. Simultaneously, they held a series of workshops in the Student Union on aspects of hunger issues led by well known authorities.

Several hundred people from campus and the community attended this fair and teach-in. CNR students who were studying food, health, development, and other related issues were, thus, challenged to synthesize their knowledge; apply it to a massive world-wide health/environmental problem; and then devise means to educate their peers and the public at large about one of the world's most persistent and tragic problems. This event proved to be a contribution of note to the community about problems and issues of profound consequence.

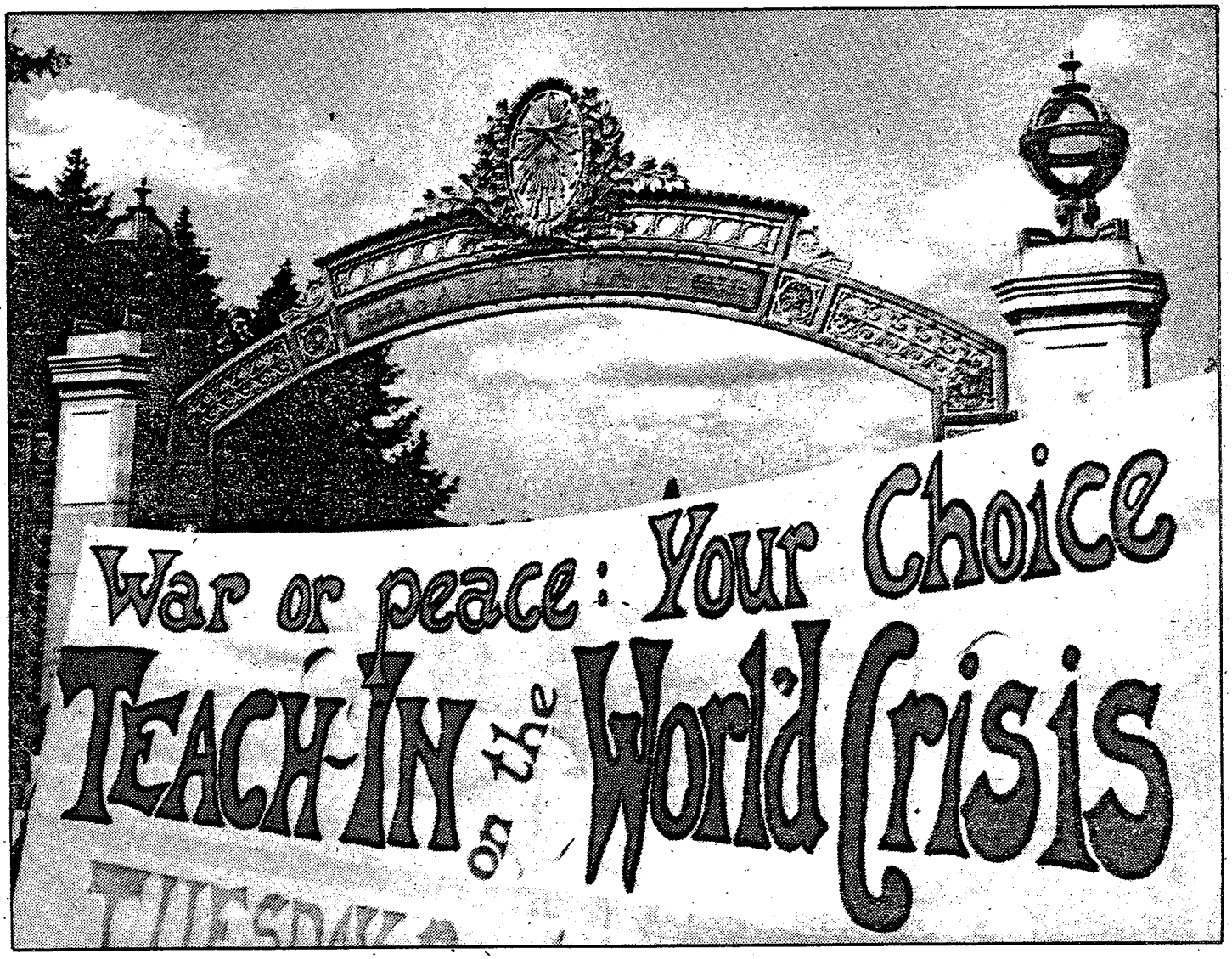
b. Teach In - Learn In on the World Crisis (March 4, 1980)

In the Winter of 1980 a CNR-191 class, Education for Democratic Action, sought to embody their theoretical work in practice to provide experience and data for further analysis and reflection. They chose to create a major educational event in Pauley Ballroom. The basic purpose of the class, the event being a manifestation of this, was to understand and create educational experiences which would both educate and move people to act and assert themselves as responsible democratic actors on issues of great import to their lives and society.

The event was of unusual significance for two reasons. One, it helped people at a confusing time to develop a reasonable analysis of a complex crisis situation that prevailed at the moment (e.g. war was threatening in the Middle East over the hostages in Iran and the Soviet incursion into Afghanistan; while draft registration was being reinstituted at home). The class wished to meet a real and pressing need. Two, the event marked a significant deviation from similar events historically, in that the class developed a theoretical and practical model that sought to engage large numbers of people in dialogue, on a sustained basis, with scholars and other knowledgeable people in all of the areas contributing to the crisis.

Why should CNR students in collaboration with others undertake such an event? As members of an interdisciplinary major concerned with understanding and solving environmental problems - many CNR

students were prepared to examine this crisis from its many perspectives, especially since an environmental issue - energy - was at the heart of the crisis. Environmental issues rarely separate themselves out neatly from the complex world they exist in. If they are to be solved their full context must be understood, and a viable solution must account for all precipitating factors. In short, such a Teach In - Learn In was an ideal educational contribution for CNR students to make.



The all day event drew over 2,000 people, strong testimony to its need and timeliness, to listen to and enter into dialogue with over 30 knowledgeable people - Daniel Berrigan, Holly Near, Tom Hayden, Peter Dale Scott, Laurie Garrett, Diane Thomas-Glass, Charles Schwartz, Mayor Gus Newport, Steven Talbot, Robert Meerpool, Ali Aliyami, and many more.

The text from a flyer publicizing the event will convey the substance and spirit of this occasion - the first learn-in:

> "Join together at 3 p.m. in Pauley Ballroom to invoke the Democratic Spirit. Help create a wall mural that illustrates our concerns. Listen to a dialogue among long time students of the issues. Participate in a small group discussion with knowledgeable people to develop your own analysis of the crisis. Bring and share food for a dinner, which will be accompanied by theatre and music with Holly Near. Continue into the evening with a focus on developing solutions. Help formulate proposals for action for the University, for Berkeley, for the nation, and for the world. Go forward with a deeper commitment to continued collective action.

The day and evening were successful in the eyes of the participants, many of whom were still deep in discussion when the building had to be locked at midnight. An editorial from the Daily Californian following the "learn-in" speaks to its significance:

"Start of an Era"

> "It's a good sign that so many people turned out in Pauley Ballroom Wednesday afternoon and evening to educate themselves on and debate the merits of the 'Carter Doctrine' and draft registration.
>
> "We see it as an indication of students' understanding that national unity is worthless, even dangerous, without national debate. Wednesday's teach-in was in many respects an historic event. Such educational sessions have been notably absent from this and other campuses for many years..."
>
> -The Daily Californian, March 7, 1980

c. **Highlander** RESEARCH AND EDUCATION CENTER

CNR students and faculty, often in collaboration with other groups, have sponsored a number of forums, symposia, and other events on three separate occasions over the past two years featuring past and present staff members of the Highlander Center - America's preeminent democratic education center. For example, Highlander was the acknowledged educational force behind the Southern Civil Rights Movement, which had such deep-reaching effects on our society. Martin Luther King, Jr. first attended Highlander when he was in high school.

CNR students not only organized many public forums but also brought these staff persons to share with them in a number of their classes. The sustained exposure to key Highlander staff members has contributed immeasureably to CNR students who are struggling to understand and implement democratic educational practices. Their presence has not only been instructive, but inspirational in putting students in touch with a long and successful tradition in democratic education.

Partial list of April-May 1980 Highlander forums:

- Highlander and the Civil Rights Movement. This event drew several hundred people to Wheeler Auditorium for presentations by, and discussions with: Myles Horton, founder and long-time director of Highlander; Septima Clark, a remarkable 82-year old black woman who, as educational director of Highlander, developed and guided this nation's most successful literacy program ever, the citizenship training schools; and Guy Carawan, Highlander's musical director who introduced "We Shall Overcome" to the Civil Rights Movement and the world.

- The History of Highlander with Mike Clark, current director of Highlander, and Myles Horton. A presentation and discussion of the 50 year history of this seminal institution.

- Appalachian Poverty and Highlander. Addressing poverty in Appalachia, particularly environmental issues tied up in land ownership, resource issues, and environmental health.

November 1980 visit of Myles Horton. He met with a number of CNR classes and held several informal public sessions of great value to all who attended, over a four day period.

Partial List of April 1981 Highlander forums:

CNR students in collaboration with Chautauqua and a group of students from Stanford brought Mike Clark and Doug Gamble, public affairs director of Highlander, for a series of meetings on the Berkeley and Stanford campus. Two of the more important Berkeley meetings are noted below:

- Democratic Education and Community Organizing in the 80's. Over 200 people attended a panel discussion with leaders from several progressive groups in the Bay Area, including Meiklejohn Civil Liberties Institute, KPFA Radio Station, Teamsters for a Democratic Union, Highlander and several others. They came together to discuss the nature of the resurgence of actions violating their civil liberties emanating from the rightward drift in America, and to enter into dialogue over how to respond to this threat.

- Health and Environmental Issues in Rural America. Examined Highlander's extensive work in these areas in Appalachia, and discussed the origins and birth of their two recently published resources for this work: "Land Ownership Patterns and their Impact on Appalachian Communities" and "We're Tired of Being Guinea Pigs! - A Handbook for Citizens on Environmental Health in Appalachia."

"The Greatest Education Comes from Action, . . . the Greatest Action is Struggle for Justice"

- Myles Horton, quoted from Bill Moyers TV Journal
July 1981

d. The Wednesday Film Series with Discussions (Winter 1980)

The CNR Student Organization in cooperation with CalPIRG presented an eight week film and discussion series that probed several current and serious environmental health issues.

e. Community Self-Reliance Lecture Series (Fall 1979)
The CNR Student Organization sponsored a lecture series that brought a number of persons of national distinction to campus to discuss all aspects of "Community Self-Reliance" - the use of local human and physical resources to meet local needs. CNR has been in the forefront of this movement nation-wide.

C. Contributions to the City of Berkeley and the Wider Community

CNR's tremendous contributions to the surrounding communities, especially the City of Berkeley, since its inception in 1970 is one of its most impressive achievements. It is unlikely that any other undergraduate major, as an integral part of its educational program, even approaches CNR in the extensiveness and importance of its contributions to the community. The CNR program enjoys healthy and mutually productive relationships with many segments of the Berkeley community - from the Mayor and City Council, to the schools, to name but a few. The historic split between town and gown has been admirably transcended through long and responsible participation and collaboration by the CNR community.

Participation in the broader community in assisting to develop and enact solutions to environmental problems is a central feature of CNR's educational program. It has been an outstanding success when judged by all relevant criteria as is documented throughout this report.

We will focus primarily on those contributions in which CNR students were either the principle initiators, or where students were collectively involved with faculty or staff or both from the outset of a project through its realization. Even then we will only be able to describe the more significant contributions. It is not feasible to delve into here the many contributions individual CNR students have made to communities locally and around the world as a result of literally thousands of field studies and internships in hundreds of different public agencies, public interest organizations, and local community groups. Some idea of the value and diversity of these contributions can be found in the section of this report on independent studies and internships (Part II, Section 3,C). Similarly, those substantial contributions made by CNR faculty as a result of their research and individual expertise, that are largely independent of CNR's educational program, are not appropriately considered here.

On Collective Work. We have intentionally avoided a focus on individuals in this part of the report. Though in a number of instances specific individuals are clearly identified with the projects we have described, and will describe, none of these projects would have materialized without large and sustained collective effort. Though some individuals are more critical than others, they have been galvanizing points for strong collective effort, rather than acting as heirarchical leaders controlling the strings. Their contribution is in generating and maintaining webs, not amassing personal power. Individuals' names often become short-hand reference points for collective undertakings, but given the individualistic American imperative, which is especially true in the University, the use of a person's name turns the project in the minds of many into that person's individual possession, rather than being seen as the genuine collective manifestation that it is. Thus, we have avoided the use of names in an effort to emphasize the "collectivity" and to affirm a wider sharing of credit for what people have created together. This emphasis characterizes much of CNR, in contrast to the individualistic emphasis that surrounds it. Assigning "collective credit" has been a real and serious problem within the University for a long time. The reward systems for both faculty and students do not begin to recognize it adequately. This is an interesting contradiction in a democratic society that is dependent, in principle at least, on cooperative modes of being.

A number of CNR's contributions, as a community, have gained nationwide and international attention and prominence, and each of them continue to make sustained contributions to Berkeley and the wider community: The Washington Environmental Yard (W.E.Y.); the Farallones Integral Urban House; Berkeley Outreach Recreation Program (BORP); and Berkeley Energy Self-Reliance Year (1981).

1. Washington Environmental Yard (W.E.Y.)- a communal resource for environmental education, creative play, and recreation. In 1972 one of CNR's participating faculty, CNR students, the principal and teachers from Washington Elementary School (Berkeley), and community people decided to transform the asphalt yard at the school into a living environmental laboratory. What they created together, and have maintained together, was the first Urban Environmental Yard of its kind in the country. It has drawn critical acclaim and visitors from around the world, and remains a viable and much used resource today.[4]

Hundreds of CNR students have been participants in the W.E.Y. project since its inception; in its conceptualization and design; in its initial period of creation; its ongoing recreation; and in devising and implementing many environmental education programs

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4. *For a detailed description and discussion of W.E.Y. see: Robin Moore, Open Space Learning, New School of Education Journal, Vol.2, No.4, 1973, (pp 25-53).*

with the children of Washington School. CNR students as a part of IDS-120 environmental education, and CNR-198's supervised group study, were the conceptual and coordinating heart of W.E.Y. for several years. The Yard has trees and hills and even a pond where once there was only asphalt; with gardens, creative play structures, and large loose objects that engage players. For a while (another CNR project) it even had a barn and barnyard complete with a variety of domestic farm animals.

CNR students worked with many teachers, under faculty supervision, to create and implement many creative environmental education programs incorporating every aspect of the living environment in the yard.

> "The overt purpose of project WEY...is to function as a vehicle for the development of an environmental education program within the total school-community. A highly complex, multi-faceted, cyclical process is entailed, in changing the attitudes and behavior of all participants. Progress can only occur at the rate at which a shared consciousness of what is happening evolves. In this respect physical change on the yard has been instrumental in changing the behavior of kids (instantly) and teachers (slowly, but surely); a process which eventually results in curriculum change...
>
> "It is a basic concept of ecology that diverse environments are resilient and productive. Kids too, seem to grow well in rich, choiceful, supportive surroundings. The more diversity, the more possibilities...If learning is the flow of ideas and excitement that comes from such diversity, education's role should be to facilitate the flow rather than hinder it. Kids may grow up to demand a more supportive and balanced environment. In the final analysis, learning...has to do with the development of a whole human person, of feelings and emotions, about and towards other people and all other things; of being able to understand and know oneself and to solve problems with ingenuity and humor. Environmental education, perhaps, is the generation of happiness that comes from such balance and process."[5]

2. The Farallones Integral Urban House - a research and education center to develop urban scale appropriate technology. In 1973 a CNR participating faculty member, a couple who taught in CNR's Urban Ecology and Urban Garden Ecosystems courses, CNR students, and others embarked on the transformation of a large old frame house in the poorer section of Berkeley which became the Integral Urban House.[6] What they have accomplished has gained wide recognition and international attention.

> "Farallones Institute's Integral Urban House-- Self Reliant Living in the City is a magnificent, inspiring record of eco-technically effective intelligent human cooperation...This is magnificent news for humanity. We are on our way."
>
> - R. Buckminster Fuller

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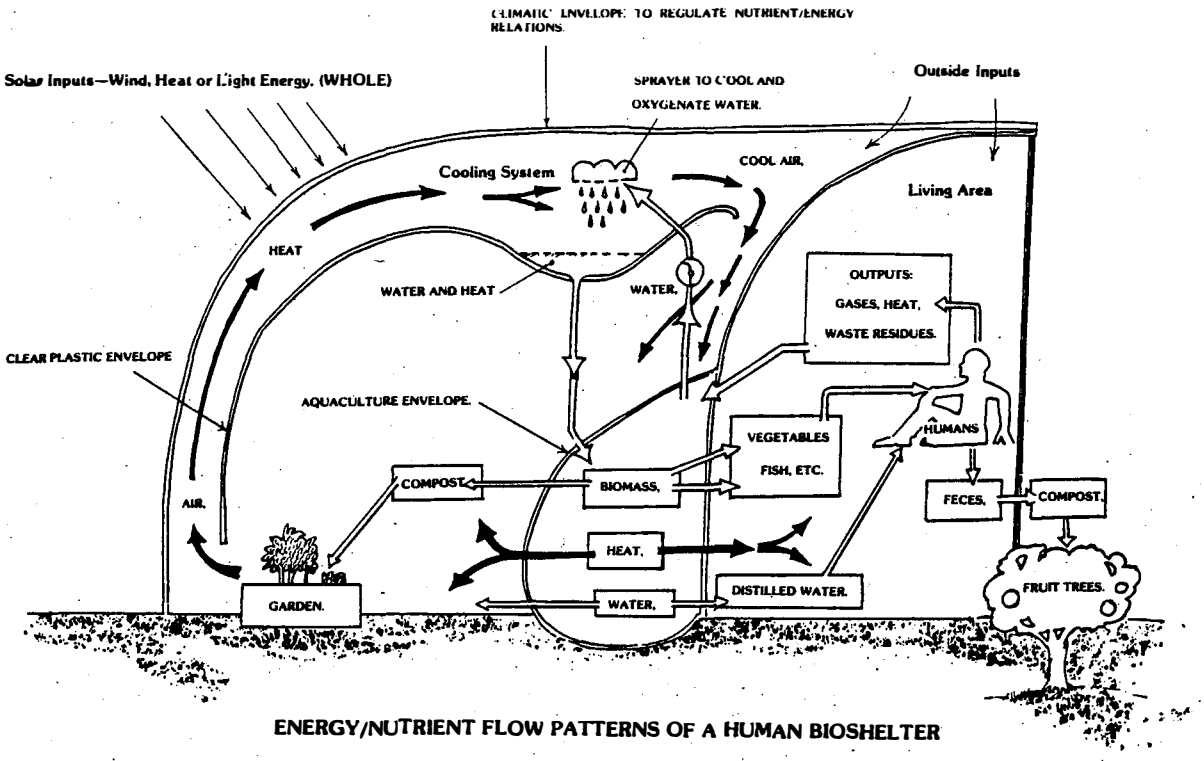
5. *Robin Moore, Open Space Learning (op. cit. pp. 27 & 53)*
6. *A detailed history of the Integral Urban House and what has been learned there is now passed on in book form for others to learn and enact. See the Sierra Club's popular book: The Farallones Institute, The Integral Urban House - Self-Reliant Living in the City, Sierra Club Books, San Francisco, 1979, 494 pp.*



ENERGY/NUTRIENT FLOW PATTERNS OF A HUMAN BIOSHELTER

Schematic Diagram Integral Urban House [7]

CNR students and graduates have been an inseparable part of the Farallones Institute (the incorporated body) since the inception of the idea. Since, they have been involved in its construction, its maintenance, in developing its educational programs, in the initiating of new Institute projects, and the administration. CNR students have worked at the Integral Urban House through internships, field studies, and as paid staff members. CNR graduates have held many responsible staff positions, including the CNR graduate who was the resident manager for many years. Many CNR students have worked on special projects of the Institute, often directing them. For example, CNR students constructed a nearly full scale, portable replica of the House which was the centerpiece at Whole Earth Exposition Fairs in major cities throughout the United States, the large Site Fair on Appropriate Technology in Oakland in the Fall of 1981, and the writing and production of the book The Integral Urban House.

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7. From Michael Coblentz, Integrating Whole Systems: Bioshelter Technology, in The Farallones Institute - On Growth and Form, Annual Report 1979, The Farallones Institute, Inc. 1980, p.8.

Many CNR students and graduates have also been deeply involved in the Farallones Institute's Rural Center which seeks to answer, in a rural setting, the same questions that the Integral Urban House seeks to answer in an urban setting, namely:

> "Our intent has been practical, to maintain or increase our competence in the daily work of meeting our needs for food, shelter and companionship from household to village level."[8]

Farallones' programs which CNR students and graduates have been integral parts of have reached around the world. Contracts with Action/Peace Corps (1979-1980) led to the development and conduct of training workshops in renewable energy/appropriate technology for Peace Corps volunteers destined for every part of the world. While local Community Technical Assistance Programs have provided workshops for "citizen activists" from low income neighborhoods so they could learn skills and return to their communities as effective and informed energy resource and program developers. This has just been a small sample of the diverse activities of the Farallones Institute that CNR students and graduates have been a part of from conceptualization to realization.

What emerges from this collaboration of so many people is a growing and learning atmosphere that has been, for well over a hundred CNR students and graduates, a dynamic, collective, living laboratory in appropriate technology from which they have learned immeasurably, and to which they have contributed immeasurably. The Integral Urban House is an invaluable resource for CNR, the nation, and the world.

3. Berkeley Outreach Recreation Program (BORP) - an accessible recreation and environmental education program for the disabled. This program was initiated in 1975 by a young disabled woman CNR student in collaboration with other CNR students and members of the community, as the culminating project of her CNR experience. Her individual experience is described elsewhere in this report, where she emphatically states that she was able to achieve this outstanding accomplishment only because of CNR's education and support (see page 27 and 84). It was the pioneering effort in the nation to make diverse recreational and environmental education options accessible to the disabled population as a public service. BORP continues to this day as a sizeable and active component of the pace-setting Center for Independent Living, the best known and most effective organization of, by, and for the disabled in the country.

BORP has attracted considerable nation-wide and international acclaim and become a prototype model for similar programs being

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8. *Lee Swensen, Counterfoil Research and the Farallones Institute, in The Farallones Institute - On Growth and Form, Annual Report 1979: (op. cit. p.3)*

developed around the world. The CNR graduate who initiated the program has travelled extensively, speaking about her work and consulting with others on recreation and the disabled.

The woman who initiated BORP, working with other CNR students, and community members conceptualized the program, secured the large sums of money required to set up the program, implemented the program on a full scale serving hundreds of persons, and served as the first director of BORP, all while she was a CNR student. BORP is an excellent example of how CNR has been able to empower individuals and groups to create new solutions to persistent problems they encounter in the world that relate to their interdisciplinary education in CNR. In this instance, as in virtually every other one we have described throughout this report, contributions to the community were made, not in spite of students' educational programs in CNR, nor parallel to them, but as a direct result and integral part of them.

4. CNR and the City of Berkeley's Energy Program.[9] 1981 is Energy Self-Reliance Year in Berkeley, another first of its kind in the country. Most simply put, CNR students and graduates are Berkeley's energy program. This major contribution of CNR to the City of Berkeley is an example of how cooperative student efforts can be both sustained and cumulative over time and almost entirely dependent on student initiative at the outset, with appropriate structures. The magnitude of CNR's contribution to the City of Berkeley in the important field of energy is striking.

To adequately tell this story we must move historically through its evolution - an evolution that is probably only possible in a program like CNR.

In 1976 students in a CNR class (IDS 10N Environmental Issues project section) conducted the basic research and gathered background information on the need and possible functions of a city Energy Commission. The group of CNR students then entered into collaboration with the Committee for New Energy to successfully petition the City Council to create the Berkeley Energy Commission in December 1976.

In January 1978 the still new CNR Student Organization (see Part IV, Section 6 for a detailed description and discussion of this organization), in deliberating over the directions it should take, consciously made a policy decision to participate, as an organization, in the community outside of the University. The first major project it chose to get involved in, after much discussion, was Berkeley's observance of SUN DAY - a nationwide day of support for Solar Energy development.

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9. *I am indebted to Larry Shapiro, a CNR Alumni and Chairman of Berkeley's Energy Commission, for the basic historical material on CNR's relationship to Berkeley's energy policy and program.*

a.  - April 30 - May 3, 1978.

The CNR Student Organization met with two other local groups who were interested in organizing the local observance of SUN DAY, CalPIRG and Berkeley Citizens Action. They became the nucleus of what became a broad-based coalition of nearly 100 community groups. Representatives from these groups formed the Berkeley SUN DAY Committee. Throughout the SUN DAY organizing effort CNR students were the primary workers on SUN DAY. Well over 100 CNR students became involved, the majority on a sustained basis, in many different ways. Over 50 received credit in various courses, depending on the nature of their involvement. The one paid coordinator of SUN DAY was a recent CNR graduate.

Over 8,000 Berkeley residents participated in SUN DAY activities which happened over a four day period (April 30 - May 3).

1. SUN DAY Celebration - a community fair (April 30). A fair was held in Willard Park that drew nearly 3,000 people from the community to Solar exhibits presented by dozens of University and community groups, including a full scale windmill. Typical of the cooperation within CNR, the IDS-120 Environmental Education class organized extensive participation in the fair by Berkeley's Schools. As a consequence, there was a plethora of Solar-related activities for children, organized and presented by the children themselves.

2. Educational Forums. Three major forums were organized, two in Wheeler Auditorium on campus, and one in the community at Martin Luther King Jr. High School. They were: State Energy Policy Forum, Energy and Environment Forum, and Labor and Solar Energy Forum. Each of these forums,consisting of a panel of prominent and knowledgeable persons from inside and outside the University, were very well attended. Another example of the cooperation within CNR is that a project section in an IDS-10 Environmental Issues class researched and prepared the position paper on Solar Energy and Jobs for the labor forum.

3. Workshops. The SUN DAY Committee offered three days of workshops on campus. During this period twelve different workshops were held on topics such as: Building with SUN, Design of Passive Solar Buildings; Wind Energy in California; The Hydrogen Technology: Will it Power us to Camelot or Drive us to Tears?; and Integrating Solar Technology into Buildings. Each of these workshops was led by an authority on the topic.

4. National SUN DAY - May 3rd was commemorated by a huge rally in Sproul Plaza that drew an estimated 5,000 persons. The rally for Solar development featured Jane Fonda, Professor Otto Smith, City Councilmember Loni Hancock, and Country Joe McDonald.

5. Local Energy Policy Community Meeting. In a brilliant move designed to harness the momentum and interest inspired by the

series of SUN DAY events the Berkeley SUN DAY Committee planned and widely publicized a public community meeting in a local high school the evening of SUN DAY (May 3rd). This meeting to discuss the future of Solar Energy in Berkeley decided to form the Community Energy Coalition (CEC), an organization consisting of 19 community and campus groups concerned with energy issues. The CNR Student Organization was one of these groups.

b. The Community Energy Coalition (CEC)

The CEC, born out of SUN DAY, remains active today. The backbone of the CEC is CNR students and alumni. The Community Energy Coalition has proposed virtually every significant piece of energy policy that has been enacted by Berkeley since 1979. Two members of the CEC, both CNR alumni, have been appointed to the Berkeley Energy Commission; one of them is its chairperson. One of these commission members, largely as a result of her energy work in Berkeley, was nominated by Berkeley Citizens Action to run for City Council.

Berkeley has taken a number of constructive steps with respect to energy. The major ones are listed below, all of which were taken at the urging of CNR students and alumni, through the CEC and the Berkeley Energy Commission.

1. The City hired a full-time energy coordinator.
2. The Berkeley Master Plan is in the process of revision to include energy concerns.
3. The City waives permit fees for solar and wind energy systems.
4. The City Council unanimously adopted the Berkeley Residential Energy Conservation Ordinance (the primary author of the Ordinance was a 1979 CNR graduate).
5. The City is in the process of converting to energy efficient street lights.
6. The City has entered into a cooperative relationship with Lawrence Berkeley Laboratory (LBL) and the University of California in the field of energy.
7. An energy management plan for City Government operations has been developed.
8. The City Council unanimously designated 1981 as Berkeley Energy Self-Reliance Year.

One of the most notable accomplishments of CNR's students and alumni in the energy field in Berkeley is the degree of cooperation they have been able to generate across all shades of the political spectrum, and between the City and the University. Both are unique in Berkeley. The knowledge and skills in developing and working in a cooperative and democratic community have had direct and visible applications and effects on energy policy and its implementation in Berkeley. For example, the Chairperson of the Berkeley Energy Commission, a 1978 CNR graduate, states in his Follow-Up Questionnaire

that: *"In retrospect, the most interesting and useful aspect of my education was learning about collective decision making...Participation in democratic decision making processes in CNR has been very helpful in my post-graduation activities. The most common mode of decision making in CNR was defined by a spirit of cooperation rather than power plays. I have tried to develop this spirit in my activities, and it usually works...It has been effective in both the Community Energy Coalition and on the Berkeley Energy Commission."*

Thus, to an extent one could not separate out from all other factors, CNR shares some credit for the fact that the energy issue is the only issue on which the entire Berkeley community is united.

c. Berkeley Energy Self-Reliance Year - 1981. The concept and program was developed almost entirely by CNR students and alumni through the CEC and the Berkeley Energy Commission. Selections from an editorial in Berkeley's conservative newspaper, The Independent and Gazette, Sunday, February 1, 1981, describes the program and provides documentation of the level of cooperation across all traditional lines of division the people from CNR and CEC have been able to craft successfully:

"Energy Self-Reliance Year"

"The City of Berkeley last month embarked upon an ambitious series of programs aimed at both conserving the energy we have and developing alternative forms of production to come up with the energy we are, or will be, without. 1981 has been proclaimed 'Energy Self-Reliance Year' for Berkeley, and it couldn't have come at a more appropriate time.

"One of the main stumbling blocks to effective energy conservation and development projects has been the overwhelming scope of such a campaign when taken on a national, state, or even regional level. Television commercials extolling the benefits of not wasting energy, PG&E pamphlets giving hints on conservation, and programs launched nationwide or statewide are fine, but they hardly begin to involve individual consumers in the energy battle.

"Berkeley has wisely decided to direct its attention to solving problems on a local level, and in doing so it has become the first city in the nation to declare an intensive campaign designed to promote energy conservation and development.

"The city has two important goals to accomplish during the year. The first is to reduce energy consumption throughout Berkeley, in both the private and public sectors, by as much as 20 percent... The second goal is to develop in Berkeley a model for other built-up California cities, where little major new construction takes place.

"Realizing that individuals are too easily overwhelmed by the enormity of the energy problem and by the variety of possible solutions, 'Energy Self-Reliance Year' has been broken up into four sections, each section to focus on different aspects of energy conservation and development. The program began with a six-week 'Berkeley Energy Action Mobilization' project, designed to focus on conservation of energy...

"From April to June, the focus will be on renewable energy sources, featuring courses and workshops on solar and wind power. July to September will feature educational sessions designed to help residents understand global energy strategies, and the relationships between local, national and international energy politics. And the year will end with a return to focusing on Berkeley's overall energy problems and ways to solve them.

"...We hope that residents will take advantage of this unique opportunity to become involved in cutting energy costs and moving toward self-reliance, if for no other reason than saving themselves money. A little enlightened self-interest will go a long way toward the program's success.

"Berkeley has the reputation, too often justified, of being a community divided against itself. 'Energy Self-Reliance Year' provides all of us a rare opportunity to drop the traditional antagonisms in an effort to work toward the common good. As Mayor Eugene Newport said at the kick-off of the program last month, 'Any time we can get Pacific Gas and Electric, the University of California, the City and the Chamber of Commerce together, and the rest of us, it is an unusual and good reason for optimism.'..."

BEAM - Berkeley Energy Action Mobilization. The first major phase of Energy Self-Reliance Year was BEAM - a six week intensive effort in January and February, that focused on increased energy conservation awareness and sought to mobilize community residents to undertake simple, practical energy conservation measures in their own homes designed to save them 25 percent of their energy costs. Free one hour workshops on simple energy conservation were offered repeatedly at dozens of locations throughout the city. A CNR graduate was the BEAM Project Coordinator. The workshops were presented by over 50 volunteers, the majority of them CNR students coordinated through a CNR-198, supervised group study, course. A CNR student was the campus coordinator of BEAM (many workshops were presented on campus for students). By the completion of the BEAM program, several thousand Berkeley residents had attended BEAM workshops.

In concluding our discussion of CNR, and Berkeley's enlightened energy policies and pioneering educational campaign to promote energy conservation, we see CNR students, and other U.C. students, through the leadership provided by CNR, making creative and significant contributions to the City of Berkeley in far greater numbers than has ever been the case in the past. An outstanding example of democratic change at the level of the ordinary citizen through education and caring, has been initiated, developed and carried out almost entirely by CNR students and alumni.

These major contributions that we have just described are only a portion of CNR's contributions to the community outside of the University. We will describe two important recent contributions - Berkeley Earth Day '80 and the development and implementation of an Integrated Pest Management Plan for Berkeley - then list a number of additional contributions to complete this section.

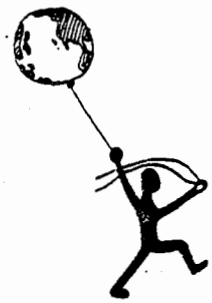
5. Berkeley Earth Day '80 - A Celebration of Community

This fair, which drew nearly 5,000 community people to Willard Park for a joyful day designed to celebrate community, educate, and evoke the humane spirit in our midst, was widely acclaimed as the most successful large scale energy and environmental education event in the recent history of the Bay Area.

10.

Berkeley Earth Day '80

May 4th



participating groups include:

Community Energy Coalition
Conservation of Natural Resources Student Organization
Ecology Center
CalPIRG
Farrallones Institute
Berkeley Citizens Action
Alternative Energy Collective
IDS 120-UC Environmental Education Class

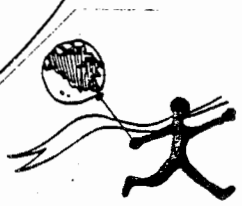
A Celebration of Community

1980 marks the ten year anniversary of the first Earth Day. In those ten years, it has become increasingly clear that environmental issues—as air quality, water quality, and land use—are inseparable from social, political and economic issues. The environmental movement has expanded, yet still we face a grave international resource crisis that within our country is contributing to high inflation, unemployment, and possibly a war. ***Berkeley Earth Day '80 is a local response to this global crisis.***

On May 4th at Willard (Ho Chi Minh) Park, Berkeley Earth Day '80 will be celebrated with a community fair.

We've planned ***Berkeley Earth Day '80*** *to celebrate and encourage the movement in our community dedicated to meeting human needs in a democratic, non-exploitive, environmentally sound manner.*

Berkeley Earth Day '80
2490 Channing Way, Suite 219
Berkeley, CA 94704
642-9577



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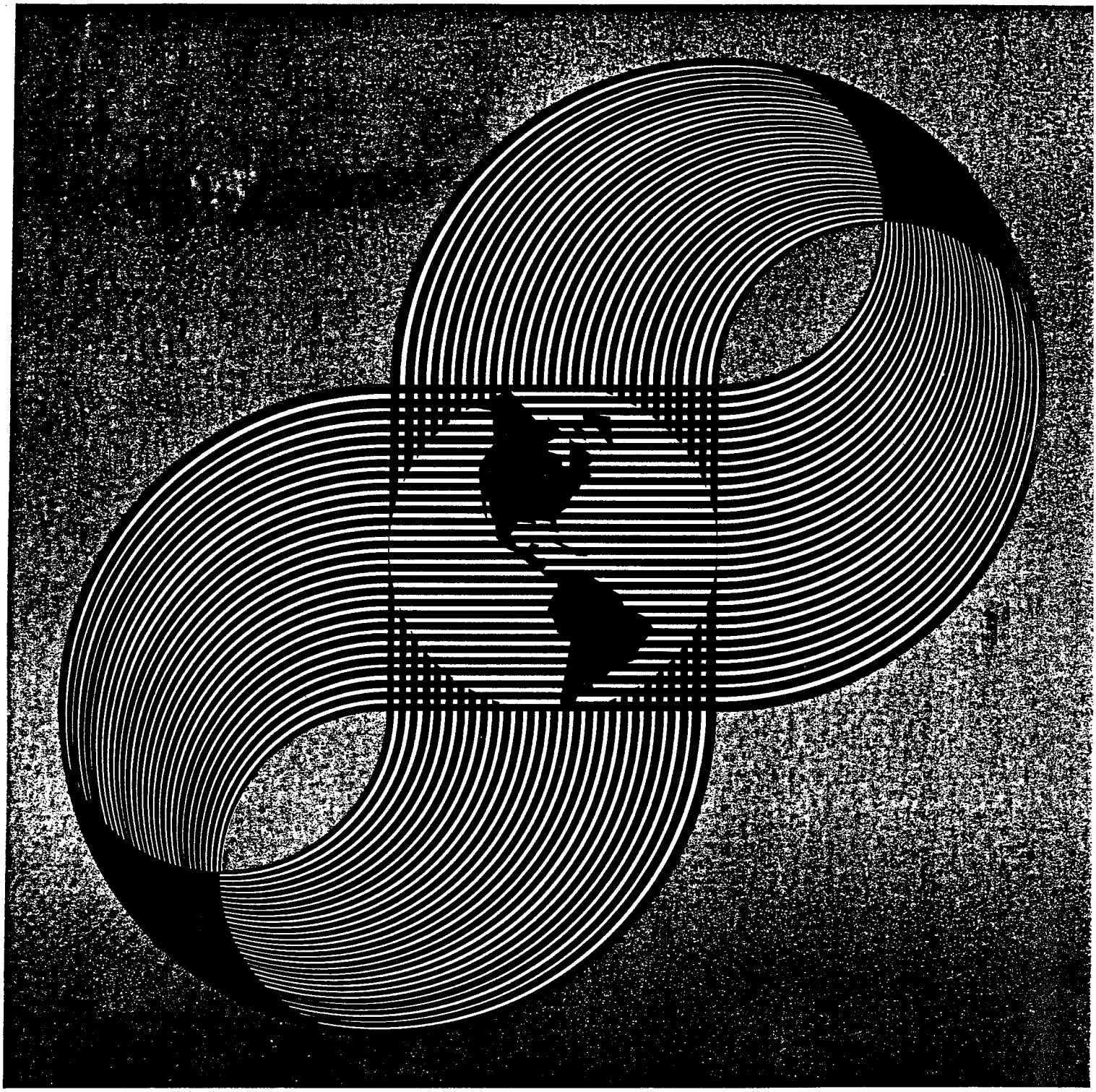
10. *This graphic is from the memorial book published as A Tribute to Septima Clark and Rosa Parks, two outstanding black women, and leaders of the southern civil rights movement who are associated with the Highlander Center, for a large testimonial dinner in their honor in the East Bay on May 1, 1981. This is one example of the networks devoted to democratic change through education that CNR is integrated into.*



Berkeley Earth Day '80

May 4th A Celebration of Community

Berkeley Earth Day '80 was the project of a year long CNR Environmental Education class (IDS-120). The choice to create a fair was a point in a continuing process. Prior to the choice the class had, in the context of a democratic educational model, decided on a set of explicit criteria they wanted to try to realize in their project. A number of potential projects were carefully examined and a community fair emerged as the consensus of the group as the project through which their criteria were most likely to be realized. The class then joined in collaboration with the Community Energy Coalition (another CNR-generated group described earlier in this section), who were also interested in producing a fair, to form the Berkeley Earth Day '80 Committee to conceptualize and organize the fair. A large majority of the members of BEDC were IDS-120 class members, and the rest were virtually all other CNR students and alumni. The IDS-120 class was the critical center and the bulk of the fair's work force. One of the position papers developed for the fair contains the following statement of purpose:

> "We are evolving Berkeley Earth Day'80 to celebrate and encourage the movement in our community dedicated to meeting human needs in democratic, non-exploitative, and environmentally sound manners. It is our concerted goal to evoke for a day the spirit and form of our vision of an ideal democratic community sensitive to the need for self-reliance, while not being unmindful of how a community must fit in harmoniously with all other communities around the world striving to fulfill similar visions."

Berkeley Earth Day '80 brought together over 100 community groups, free of commercialism, to provide a rich array of offerings: participatory events, including a walk-in "international environmental/development policy and issue game" created by CNR's Political Economy of Food and Agriculture Area of Interest Group; activities for the young and old; workshops; popular culture, including folk singers, dancers, children's theatre, and bands; displays; and a rally with local leaders for speakers. The day ended with a large and joyful community square dance as the sun was setting across the Bay. A peaceful and caring day was had by all, without a significant hostile incident - a rarity in Berkeley for large events - attesting to the organizing and planning skills of BEDC right down to a 20 person "non-violent" security force recruited and trained by the Committee.

A word about the economics of the fair is important. The Berkeley Earth Day '80 Committee raised all of the money required for the fair, which generated a cash flow of over 7,000 dollars. If the city had contracted with a non-profit group to produce a fair of the same magnitude it would have cost approximately 100,000 dollars; and it is dubious, judging from experience, that a salaried group could have produced an event so fully infused with a democratic and giving spirit. Thus, the city and public received, FREE, a notable educational occasion for all. This holds true for many other contributions of CNR to

the community as well, the recently completed BEAM project and Berkeley SUN DAY that we have already described, for example.

In keeping with tradition in CNR there was a substantial period of critical evaluation and reflection after the fair to examine and consolidate what had been learned - not only the quality and logistics of the fair itself, but, equally important, the quality of the collective process by which the fair was created and organized. As part of this process evaluation forms were distributed to many persons attending the fair. A few quotes from these capture the flavor of its impact:

> "I learned more today at Earth Day than I have the whole year in classes. It has been an educational experience that cannot be matched. Every community must have one if we are to save the world for our children."
>
> "Earth Day '80 has reaffirmed my faith in humanism and the community spirit. Absolutely terific!"
>
> "Yes! A true celebration of community. I found information, comraderie, and general joyfulness. I think people will be working together more and more to transform cities into viable communities."

What was the impact of the creation of the fair on the students who gave birth to it? In the process students learned a tremendous amount: theoretical knowledge and understanding of many fundamental topics in education and how to realize these concepts successfully in practice. A few representative statements from their final evaluations after working together for a year will give voice to the relationship between knowledge and practice that seems to be crucial if the world is to resolve current crises for the benefit of mankind. An IDS-120 member who is now in law school states:

> *"...my perspective has changed. I have struggled to overcome a false belief: intellectual bias, discrimination, elitism. IDS-120 has educated me to the equality of dignity and worth of all people...I've learned the spirit of democratic, collective education is potent, demonstrable, and verifiable. 'The error of the ages is preaching without practice.' (Mary Baker Eddy). We practiced...I have been changed by my participation in Berkeley Earth Day '80...Most important, now I know participatory democracy is not "pie in the sky". IT WORKS Here and Now. Berkeley Earth Day '80 culminated in an event, a fair, that was a unification of process and content, form and structure."*

Being a part of a successful collective effort in CNR has both energized and given hope to young people in the midst of despair and apathy. Another IDS-120 member who has embarked on a successful career in environmental media expresses it in a poem:

"It is you - people
who have helped me learn how to care
how to share
and how to listen.
To feel a part of you all
gives me strength to believe
that these huge s uggles
and forces
which keep trying to push
creativity
to its baseme t dungeon
are not beyond the reach
of US
and PEOPLE like us
working together
in the form of a bond."

A woman who has become a respected leader on campus reflects:

> *"I'm proud when I recall seeing very apparent at the fair our criteria and values materialized--participatory, educational, on-going, community spirited, political, and fun. I'm proud when someone says (like they did yesterday) that 'What we want to aim for is something like B.E.D. '80 accomplished.' ...I'm panicked to think that because of IDS-120, I may have reached the zenith of my experience in my nineteenth year. You all were the ultimate people to work, create and grow with...Thank you for touching my life in a profound way."*

From another class member that was elected to the ASUC Senate and was instrumental in the founding of Cooperative Connections:

> *"Organic creation, empowering growth--*
> *challenged the reality which we did so loathe.*
> *And in doing so sealed the oath--*
> *now to be pursuers of Equality and carriers of Hope.*
> *"Liberating, empowering, and maturing each of us individually and collectively; determining the worth and value of our process; transforming 'democracy' from simply a political construct to a personal way of life and a purposeful governing process."*

We have dwelled briefly on these evaluations from members of the CNR community in an attempt to concretize the impact on people's lives of gaining knowledge (academic content) within a collective democratic framework (furthering the ideals of our democratic society) in the process of assuming significant social responsibility and contributing something of acknowledged value to the community of Berkeley. It is this synthesis, in contrast to the more typical fragmentation, which occurs so frequently in the CNR program as we have documented.

6. Development and implementation of an Integrated Pest Management Plan for the City of Berkeley (1980)

This major contribution to Berkeley illustrates another feature of CNR - its capacity to encourage and support individuals and groups, with human and physical resources and course credit, to pursue critical questions in-depth and to follow them through to their logical end of affecting public policy and practice.

This story begins with the interest and concern of one CNR student and expands to incorporate many others in the CNR community and beyond. It began with a young woman gaining the basic scientific knowledge of the nature and effects of pesticides in a number of U.C. courses. She was then encouraged by a CNR staff member to run for the board of directors of CalPIRG and was elected. In that capacity she initiated a project investigating pesticide use in Berkeley. She became alarmed when she found that "nobody knew anything" and that there was neither systematic information maintained within agencies, nor any centralized data on overall use. Drawing on and expanding her academic background she initiated and completed a thorough investigation of pesticide use by all public agencies working in Berkeley - BART, CalTrans, School District, Parks and Recreation, Housing Department, etc. The extent of pesticide use that she uncovered by dozens of agencies in a totally uncoordinated fashion, including many clearly illegal applications, was overwhelming. Her startling and revealing conclusion that has held up under rigorous scrutiny was - more people are exposed to more pesticides in cities than any people on farms anywhere.

Feeling a responsibility to go beyond issuing a well documented and knowledgeable report, she tapped into the CNR network and became active in a number of community groups, including the recently formed statewide Coordinating Committee on Pesticides, to seek appropriate changes in public policy in Berkeley. Subsequently she was instrumental in forming a Pesticide Sub-Committee of the city of Berkeley's Community Health Advisory Committee. An extensive public education campaign was initiated with lengthy articles in many East Bay newspapers and radio interviews which culminated in a large public meeting on pesticides called by the Community Health Advisory Committee, which the student had become a member of. This meeting was followed by a public workshop on pesticides held by the Berkeley City Council. The CNR student was chiefly responsible for orchestrating these hearings through cooperation with a number of other CNR students, alumni and others throughout the city. These meetings led to a series of recommendations on pesticide use.

The recommendations were brought before the City Council on July 10, 1981. The Council voted unanimously to ban temporarily all herbicides, three insecticides, and a fungicide, until an Integrated Pest Management Plan is approved by the Council, and further specified that prior notice must be given to the public before the application of any toxic substances by public agencies

in Berkeley. Thus, from the initial impetus and persistence of one CNR student which led to increasing involvement of CNR students, staff, faculty, and alumni as well as other community members, the City of Berkeley has become one of the first cities in the nation to develop systematic and centralized recording of pesticide use within its boundaries, and a 'state of the art' coordinated Integrated Pest Management Plan for the entire city.

The story does not end here. The CNR student, now joined by other CNR students (it has not been atypical in CNR for students to create opportunities for each other as the result of their work), worked to strengthen several Bay Area community groups concerned with pesticide use, especially the Coordinating Committee on Pesticides, which continues its very effective educational and policy work. For example, it has played a critical public education role in the panic and lack of knowledge surrounding the Mediterranean Fruit Fly crisis in California (July 1981). The CNR student who initiated the chain of events we have been describing became a staff member of the Coordinating Committee on Pesticides and in that capacity organized, with the help of many CNR students, staff, and faculty, the well attended "Community 'Bug Out'" held at Laney College in Oakland (January 1981).

Community 'Bug Out'

The "Community 'Bug Out'" was a day of imaginative public education on pest control, focusing on what private individuals could do to minimize their use of toxic pesticides, as well as larger public policy issues. The 'Bug Out' featured speeches by members of the Oakland City Council and authorities in the field of pesticide use and Integrated Pest Management. Workshops were held, a number of participatory displays were set up by community groups and local museums, with a very special "circus" for children young and not so young. An excellent educational mode actually led people to change their practices in the interest of protecting their own health and well being through education and the demonstration, in this instance, of viable alternatives.

What we see from this description of CNR's involvement in pesticide issues in the East Bay is that in this area, as in the area of energy, the CNR community has played seminal and crucial leadership roles which have led to important changes in public policy and practice. The effect of CNR students' involvement in pesticide issues in the East Bay on the health of Berkeley's children and adults can not be fully assessed at this time, but it can not help but be considerable - and it could easily prove to be extraordinary in the long run, given the limitations of our current knowledge of the long-run health consequences of many of these substances. The emerging wealth of data about the serious effects of the herbicide "Agent Orange," used in the Vietnam war, on the Vietnamese and American personnel who were exposed to it should give us pause. We may owe more to this CNR student's contribution to the City of Berkeley than we know.

There follows a list of additional contributions of the CNR community to the community beyond the University. Though we will not develop these in detail, their development was similar to the patterns we have been describing above.

7. Berkeley Bottle Ordinance. The Berkeley Bottle Ordinance was adopted by the City Council in 1976. The Ordinance, which is currently in litigation, requires that beverages be sold in returnable containers. The feasibility study that led to the adoption of the Ordinance, as well as much of the drafting of it, was the work of CNR students.

8. Traffic Management Plan. Berkeley's traffic diverter system, first implemented in 1975, is part of the city's Traffic Management Plan. Much of the initial work that ultimately led to the development of the Traffic Management Plan was performed by a CNR student who was working under the supervision of a Berkeley City Council member.

9. Composting. During 1978, the City of Berkeley administered a composting project at the Berkeley landfill. The project was begun after CNR students and alumni persuaded city officials about the feasibility of composting as a method of recycling organic waste. The project was discontinued due to loss of state funding.

10. KPFA - listener sponsored radio station. CNR students participated in the creation and development of the Environmental Media Collective of this pioneering and national pacesetter for community radio. CNR students have worked in the public affairs and news departments. Currently a CNR graduate is co-director of KPFA's national award winning news department.

11. SAVY. Savy, an extensive guide to Berkeley's agencies, organizations, and resources was largely researched and written by CNR students and published in 1976.

12. Members of City Commissions. Five CNR alumni currently (1981) serve the city as members of the Planning, Energy, Solid Waste Management, and Underground Utilities Commissions.

13. Community Service Agencies. A large number of CNR students have worked in field study placements, and as interns, in a wide variety of community service agencies, such as the Free Clinic; the Berkeley Women's Health Collective; Parks and Recreation; the public schools; and many more.

14. Miscellaneous. CNR students have participated in many other projects that have been of direct benefit to the City of Berkeley. These include development plans for local parks; creation of a residential energy audit program; investigation of the impact of real estate speculation on Berkeley; and the production of an energy conservation guide for tenants.

In conclusion, CNR's contributions to Berkeley, Bay Area Communities, and beyond have truly remarkable, especially in comparison to other undergraduate programs. What we have witnessed is that CNR in the areas of its expertise has, rather than remaining isolated and elite within the University, fully integrated itself in the community and provided outstanding public service. It has initiated, joined, and worked in coalition with many community groups, public agencies, and elected government bodies to develop critical knowledge and information, to educate the public, to activate informed public concern from the "grass roots", and to move by responsible and effective steps to develop and obtain implementation of enlightened public policy and practice. The work of CNR students has been so thorough and effective that recommendations they propose are often adopted by the responsible government bodies unanimously, as in the cases of energy and pesticides. Thus, we see the democratic process working exceptionally well in generating positive changes for the benefit of the citizens of Berkeley and ultimately the nation. This is precisely what the Charter of the University of California mandated in establishing the University.

The value of these accomplishments, that have taken years of cumulative efforts to construct, to the education of CNR and other U.C. students is extensive. For students, the networks that have been developed provide unparallelled educational opportunities to become engaged in meaningful and socially productive work in the community as an integral part of their learning experiences in CNR. This has prepared them, as we document throughout this report, to assume responsible, and often paid, leadership positions in their communities in areas of their expertise.

CNR's contributions have not gone unrecognized outside of the University. We reproduce below a letter from the the Mayor of Berkeley expressing his, and the city's appreciation for CNR's many outstanding contributions to the larger Berkeley community.

City of Berkeley

Eugene "Gus" Newport
MAYOR

Office of the Mayor

December 18, 1980

Ira Michael Heyman, Chancellor
200 California Hall
University of California
Berkeley, California 94720

Dear Chancellor Heyman:

I would like to call your attention to the Conservation of Natural Resources field studies program which is administered by the Department of Conservation and Resource Studies. Students in this program have made many valuable contributions to the City of Berkeley, both in the development of policy as well as by organizing events and institutions that have served the community.

Since I took office in 1979, students in Conservation of Natural Resources have taken significant responsibility for the development of policy in a variety of fields. They have been particularly helpful in the field of energy. Conservation of Natural Resources students helped draft the Berkeley Residential Energy Conservation Ordinance, serve on the planning committee for Berkeley Energy Self-Reliance Year, have studied the feasibility of organizing a municipal solar utility in Berkeley, and are helping to organize Berkeley Energy Action Mobilization (BEAM), a massive energy conservation campaign scheduled to begin in January. During the coming year, we expect to continue to work closely with Conservation of Natural Resources students in the development and implementation of local energy policy.

Conservation of Natural Resources students have been helpful in other fields as well. Preliminary research by a Conservation of Natural Resources student on the use of pesticides and biological alternatives culminated in the development and implementation of an integrated pest management strategy for the city in July. Students from the Conservation of Natural Resources have also been helpful in the development of housing and land use policies.

One of the most important contributions that Conservation of Natural Resources students have made to the community was their work in organizing Berkeley's 1980 observance of Earth Day. More than thirty students organized a massive environmental education fair at Willard Park. Eighty community organizations participated in the fair, which was attended by more than 5,000 people. The fair was a joyous event that united our entire community. It was organized primarily by the Conservation of Natural Resources students.

Over the years, Conservation of Natural Resources students have made many other important contributions to the city. These include the creation of the Farallones Institute Integral Urban House in 1974, drafting the Berkeley Bottle Ordinance in 1976, and their participation in the planning and organizing of Berkeley's observance of Sun Day in 1978. I have worked closely with a number of Conservation of Natural Resources students and alumni, and I am particularly impressed by their creativity and by their dedication to the development of solutions to the problems of the urban environment.

The Conservation of Natural Resources field studies program has been very helpful to the city while offering students the opportunity to incorporate applied research, policy development, and interaction with community organizations into their educational experience. We plan to work closely with students and faculty in the Department of Conservation and Resource Studies in the future and look forward to developing similar relationships with other departments at the University of California.

Sincerely,

Eugene "Gus" Newport

Eugene "Gus" Newport
Mayor

cc: Paul Gersper, Chairman
Department of Conservation and Research Studies

Part VI. Women and Men in CNR

The "equality" that tends to permeate CNR, especially relative to other programs on campus, which is described and documented throughout this study, extends to women. Of the four CNR faculty members whose appointments are officially in the CRS department (Spring 1981), three are women. Since CNR's inception there has always been at least one woman faculty member among the small core of persons who worked closely with the program.

Sex Ratios

Current Undergraduates

-CNR undergraduates: Spring 1981: Total enrollment = 292

women.....58% men.....42%

-U.C. undergraduates: January 1981: Total enrollment = 21,627

women.....43% men.....57%

Graduates

-CNR graduates

-All known CNR graduates as of Spring 1981: N = 941

women.....48% men.....52%

-CNR Follow-Up Study: Classes of 1971 through 1979: N = 217

women.....46.5% men.....53.5%

-Earlier CNR Follow-Up graduates: 1971-1975: N = 96

women.....42% men.....56%

-Recent CNR Follow-Up graduates: 1976-1979: N = 121

women.....49% men.....51%

-U.C. graduates: U.C. graduate survey, classes of '71,'74,'77: N=2,198

women.....41% men.....59%

-Earlier U.C. graduates: Classes of 1971 and 1974: N = 1,529

women.....39% men.....61%

-Recent U.C. graduates: Classes of 1974 and 1977: N = 1,279

women.....43% men.....57%

The Conservation of Natural Resources, a broad interdisciplinary area of concern, is a relatively new focus of concentration in academic studies. The CNR program, since its inception, has drawn more nearly equal percentages of women and men than either the natural science and natural resource fields it has traditionally been most closely associated with, or the U.C. undergraduate program as a whole. It is noteworthy that the percentage of women in the program has steadily increased from a majority of men in the early years to the current majority of women (currently: 58 percent women, 42 percent men). A shift of similar magnitude has not occurred in the undergraduate population as a whole; though the percentage of women has slowly increased, the majority of U.C. undergraduates are still men (currently: 43 percent women, 57 percent men).[1]

Thus, CNR has successfully attracted and retained increasing percentages of women, by satisfying their educational interests and providing an appropriate, encouraging and supportive environment. This is significant, in that the fields traditionally most closely associated with the conservation of natural resources remain male dominated. Women have been on the whole, historically as well as in the present, more concerned with issues of preservation and conservation than men. We might reasonably infer that this tendency, along with the unique characteristics of CNR, have been operant, in drawing disproportionate numbers of women to CNR. Many of these women go on to advanced degrees in natural resource and natural science areas, maintaining a conservation and environmental problem solving emphasis. Thus, the end use to which knowledge in many traditionally male dominated fields is put (e.g. consevation vs. utilization) appears to play a significant role in determining the percentages of women that will be drawn to them. The data from the careers of CNR graduates supports this inference (see Part VIII, The Advanced Education, Careers, and Lives of CNR Graduates).

Women, within CNR, have distinguished themselves as undergraduates as we have documented throughout this report. While many men have also had distinguished undergraduate careers in CNR, the evidence indicates that an unusual percentage of women, when compared to men, fall into this category. They have demonstrated noted ability in many areas: academic performance - CNR's University Gold Medalist was a woman; leadership - within CNR and across campus: a CNR woman graduate is ASUC Academic Affairs Vice President, and a woman CNR student is an ASUC Senator at this writing; and Awards, Fellowships, and Grants received - during the period that

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1. An excellent overview on the issue of women in the academic world can be found in: Editors of Change Magazine, Women on Campus, the Unfinished Liberation, Change Magazine Press, New Rochelle, N.Y., 1975, 256pp; University of California, Berkeley, Women Students at Berkeley: Views and Data on Possible Sex Discrimination in Academic Programs, June 1977; and Women in Education, Harvard Educational Review; Part I, Vol.49, No. 4, Nov. 1979, whole issue; Part II, Vol.50. No.1 Feb. 1980, whole issue.

this study was being written a CNR woman received the University's Eisner Award in Photography; five women are undertaking projects with the aid of President's Undergraduate Fellowships (Spring-Summer 1981), three are completing an internship at the Ben Gurion Environmental Center on the Negev Desert in Israel, one is doing a study of "appropiate technology" in China, and a fifth is undertaking an ambitious photo-journalistic project on energy issues and the people and environment in the American Southwest; and a woman recently completed (Fall 1980) a film - Es Difícil Escoger - on nutrition for Chicano children with a $26,000 grant from the State Department of Education.

Women over twenty-five years old in CNR. One of the significant phenomenon in higher education in the last decade or so is the return to college of substantial numbers of women who have worked in jobs far below their capacities for several years; or who are raising families, either married or as single parents; or whose children have grown up and left home. These women encounter many problems upon returning to college, or entering for the first time; one of the most alienating is the typical relationship between student and professor which requires a degree of student ingratiation that older persons tend to resent deeply.[2] A considerable number of CNR's women students are over twenty-five (10 percent of the undergraduate women at Berkeley are twenty-five or older). These women have consistently expressed a special appreciation for their education in CNR, many of them indicating that they could not have tolerated remaining in school if they had not found CNR. For example: *"I doubt very much if I could be in any other program at CAL, particularly as an undergraduate 25 years old with several years of work and life experiences. In fact...I'm positive!"* They have flourished from the equality, respect, and dignity they are afforded in CNR, which they report that they rarely encounter in other departments. In addition, it is particularly important to most of them to have the ability to fashion a program that meets their unique needs and interests as is possible in CNR. Many of these women have been very active in the CNR community and in CNR cooperative projects. The existence of a cooperative learning community in CNR allows older women to enter a collegial culture with students, staff and faculty, that is applicable to their maturity and needs. This is in marked contrast to the standard youth culture that abounds on and around campus and which is largely social and unsuited to the needs and lifestyles of most of these women. Thus, older women in CNR are able to find a supportive and encouraging environment and more fully integrate themselves into a community and educational milieu. Their counterparts in virtually every other undergraduate program on campus find themselves relatively isolated from other students in their programs, and tend to be forced to limit themselves to attending classes as the sum total of their educational experience at U.C.

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2. *For example see: Dainne Rothbard Margolis, A Fair Return (pp 249-256); and Pat Durcholz and Janet O'Connor, Why Women Go Back to College (pp 236-241) in Women on Campus, The Unfinished Liberation, op.cit.*

Two examples, offering a sharp contrast, will illustrate and clarify the above analysis. First, an older woman and single parent who graduated from CNR in 1980 with "highest honors" and was elected to membership in Phi Beta Kappa. Her Area of Interest was initially Terrestrial Ecology but slowly evolved to Aquatic Ecology while she was in CNR. Currently, she is enrolled in a unique small doctoral program in Applied Ecology housed in the College of Engineering. While a student in CNR she undertook and completed a number of studies used by groups and agencies outside of the University, ranging from a Draft Environmental Impact Report: Paradise Valley Development Plan, to a statistical analysis of variance study that developed a model to optimize a sampling design for zooplankton in the San Francisco Bay.

She enrolled in CNR after being out of school for several years. The democratic quality of CNR, in her words, *"Made it possible for me to be a student at Berkeley."* With respect to CNR's flexibility, with freedom and responsibility, she states: *"without the flexibility I would not have been able to, or interested in, returning to school...It took a long time to zero in on my Area of Interest. The flexibility gave me the time I needed to thrash around* [and evolve a specific Area of Interest]." CNR's faculty and system of advising provided essential ingredients that enabled her to re-integrate successfully in the University, and to accomplish the outstanding achievements that she did as an undergraduate. Speaking of her faculty advisor, she comments: *"Invaluable. _____, gave me tremendous personal support - especially helpful my first quarter.* [later] *Very helpful - especially in looking for a job."* Of the faculty, staff, and students in CNR she states: *"The most valuable of all. An oasis of community in the huge impersonal University system. It made it all possible!"*

Finally, her concluding statement in the Follow-Up Questionnaire (1980) sums up the impact of CNR on her, as an older woman and a single parent: *"I'd just like to say Thank You! CNR's flexibility, inter-disciplinary approach, sense of community, and political consciousness has made it possible for me to be a student. For someone like me, it's a real blessing that such a major exists at Berkeley."*

The second example reports the not atypical experience of an older, married woman with a family in a traditional undergraduate program, in this instance at another University. She describes the atmosphere and social-relationships that she encountered: *"The usual relationship between student and professor - painfully heirarchical - requires a degree of student obsequiousness that the suburban housewife has long forgotten. At first she might be indignant at careless slights: professors forget appointments and lose papers...She might even fight for her 'rights' as I did when I knocked at Deans' doors with bitter complaints. But soon she learns that common courtesy in academia is as uncommon as middle-aged women, and after a year or two she reverts to childish attitudes, responding to affronts with 'Oh! That's all right,' and sometimes even meaning it."*

This woman went on to graduate school and completed a Ph.D. at a major eastern university, playing, in her words, a "student vassal" in school, while being a "self-assured local politician" and community leader at home.[3]

Younger women, as well as older women, are conscious of the special quality of the atmosphere CNR creates for women. A younger woman who transfered from a prominent eastern college to enroll in CNR and who graduated in 1981 exemplifies this experience. While a student, she was a staff member of the ASUC Student Advocate's Office, with responsibility for women's and environmental health issues, and hence, developed a broad perspective on women's experiences on the Berkeley campus. She states: "*As a woman, CNR was my first experience with non-discrimination. Here the community goes to great lengths to overcome stereotypical images of women as lesser intellects and citizens, my confidence and intellect have grown by leaps and bounds. Although this approach to sexism should be an integral part of all education, CNR is a rare opportunity for women to experience 'true' equality. The availability of women professors has a great deal to do with the success of women in the program. With _____ and _____ as role models, women feel less excluded from the academic process.*"

She goes on to speak as follows of her education: "*CNR provided me with top quality education, far superior to other programs I participated in at U.C. Berkeley. The depth of understanding I have gained is the result of excellence in teaching and human support I had at all times from other students, faculty, and staff.*" In the brief time since her graduation she has participated in the creation of a "collective business", mostly with other CNR graduates, that is already thriving, which works as consultants, designers, and builders for Wind, Solar, and Edible Landscaping Systems.

The educational climate for women in the CNR program and community is, thus, a demonstrably healthy one. Women are encouraged, with minimal or no evident prejudice, to fully develop their academic and professional potentials in whatever directions their interests take them. CNR appears to create a climate and role models for women to develop experience and skills in many realms of organization and democratic leadership, so essential for success in the careers they eventually choose.

CNR's women graduates have continued to distinguish themselves in many ways after graduation. Examples previously noted are the woman (1975) who is the Dean of Continuing Education

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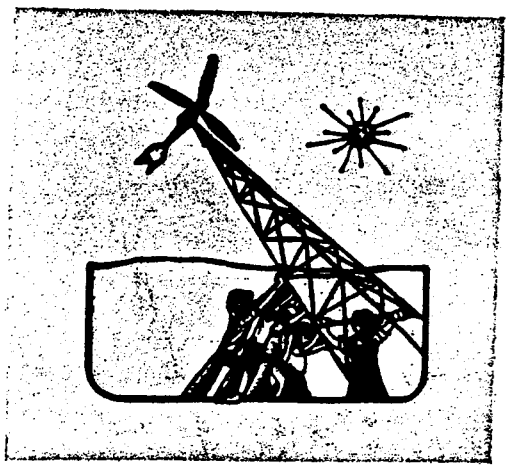
3. *Diane Rothbard Margolis, A Fair Return, in Change Magazine Editors, Women on Campus - The Unfinished Liberation (Change Magazine Press, New Rochelle, N.Y., 1975 pp 250-251). For comments from women students at Berkeley along the same dimensions, see Women Students at Berkeley (op.cit.)*

at a University and has been nominated for the "Woman of the Year" award, and the woman who has become an international leader in the field of recreation for the disabled. CNR women also go on to advanced degree programs more frequently than CNR men, and in recent years more frequently than U.C. undergraduate women in general. They also tend to enter advanced degree programs in traditionally male fields - both in graduate and professional schools. Those CNR women who enter the workforce directly after graduation are employed, with very few exceptions, in areas related to their educations. Here too, CNR women have generally found employment in occupations that have been traditionally reserved for men.[4]

In conclusion, CNR sucessfully attracts and retains women, allowing them to develop their academic and leadership potentials within a relatively egalitarian and supportive milieu. CNR appears to be significantly more successful in this realm than the overwhelming majority of other campus programs.

CNR women have demonstrated in tangible and unequivocal ways - that if women are treated as equal and supported as human beings with dignity and worth, their achievements, by all traditional criteria, are at least as substantial and distinguished as those of men, even in traditionally male fields. Particularly noteworthy is the fact that this has been accomplished in a climate where women and men are equally satisfied with the quality of their education, both while students and later from their perspectives as graduates.



4. *Part VIII - The Advanced Education, Careers, and Lives of CNR Graduates contains extensive data, discussion, and analysis. See particulary section 2, part 4 Women vs. Men Entering Advanced Degree Programs, but also throughout Part VIII.*

Part VII Ethnic Distribution in CNR

Ethnic Composition of Undergraduates at U.C. Berkeley *

	Percentage CNR	Percentage College of Natural Resources	Percentage All Undergraduates
Native American	1.5	.4	.4
Asian	8.9	15.3	19.6
Black	2.8	2.9	3.5
Caucasian.....	76.4	72.2	64.5
Chicano	2.5	1.2	2.3
Latino	1.5	1.2	1.5
Other/foreign/ Decline to state	6.4	6.8	8.2

Figures as of December 1980: Source, U.C. Office of Institutional Research

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CNR departs from the campus norms in three ethnic groups: Native Americans, Caucasians, and Asians.

The Caucasians enrollment in CNR is 12 percent higher than the campus norm, which is almost entirely associated with 11 percent fewer Asians than the campus norm. The Native American enrollment in CNR is 1.5 percent, or five Native Americans. This is approximately 6 percent of the small number of Native American undergraduates on campus. The Black and Chicano population in CNR is roughly comparable to the campus norms.

The conservation of natural resources is not an especially attractive field for two of the painfully under-represented minorities at U.C., Chicanos and Blacks. On the other hand, conservation of natural resources is an area of substantial concern for Native Americans. In recent years CNR has made a concerted attempt to recruit Native American students. It has been successful, to a limited degree, compared to campus-wide enrollments. However, the lack of financial aid for Native Americans, and other discriminated against minorities on campus, has made it difficult to recruit Native Americans, and to retain them once enrolled due to cutbacks in financial aid and the continual weakening of essential support services. Given adequate resources to enable their education on campus, CNR could attract and provide a valuable education to the many Native Americans who are interested in becoming knowledgeable, and effective, with respect to natural resource issues that are arising with increasing frequency on their lands.

Part VIII.

The Advanced Education, Careers, and Lives of CNR Graduates

Introduction

> *"On many occasions in the future there will be an imbalance between the number of men [and women] trained for a given line of work and the number of jobs available. Attempts will be made to minimize this through accurate forecasts of manpower needs, but experience with such forecasts has been discouraging. The alternative - and the wiser course - is to educate men and women who are capable of applying excellent fundamental training to a wide range of specific jobs."* (John Gardner, Excellence, 1960)

The future John Gardner forecast in 1960 is essentially with us today. Our social, economic, and educational systems did not have the ability nor the will to prevent these imbalances; and institutions of higher education have, as yet, done little to respond to them.[1] According to the National Center for Educational Statistics, there were 12,087,200 persons enrolled in colleges and universities in the United States in the fall of 1980. Untold thousands of those who graduate each year are unable to find work in the disciplines or fields they majored in. This situation has markedly worsened in recent years with the precipitous decline in positions in the teaching field at all levels, the traditional source of employment for graduates from 'academic disciplines'. Academic disciplines accounted for 42.1 percent of college and university graduates in 1977 (391,000 persons). Currently about 25 percent of those receiving baccalaureate degrees each year enter the general graduate labor pool that does not require their specific disciplinary knowledge or skills (about 230,000 young persons each year).[2]

CNR graduates differ significantly from national trends and Berkeley norms. They have prepared themselves, for the most part,

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1. *For example see Roger L. Geiger,"Curriculum and the Market Place", Change-The Magazine of Higher Learning, Nov/Dec 1980.*

2. *See Roger L. Geiger, op.cit..*

for their work and lives in creative and varied ways. Gardner's advice has been taken seriously by both CNR and its students, as they have proved "capable of applying fundamental training to a wide range of specific jobs." We have noted earlier in this study how many CNR graduates report that the most important thing they learned in CNR was how to learn and think, especially a systems approach to understanding and solving problems. The environmental field has grown and diversified, especially in the past decade, in such a manner that CNR graduates are increasingly finding their interdisciplinary knowledge, syntheses, and unique problem solving skills in demand as has been illustrated throughout this report (only 3.7 percent of the baccalaureate degrees awarded nationwide in 1977 were in interdisciplinary studies). Mounting numbers of CNR people are preparing themselves, both as undergraduates and as students in advanced degree programs for fields related to global issues, and finding employment in these areas - environmental, health, food, population, energy, and human rights. Issues and knowledge that do not readily fit into the framework of existing disciplines. (see section on Interdisciplinary Study pages 31-40 for further discussion and examples)

CNR graduates, with few exceptions, have entered careers, or are studying in advanced degree programs to undertake professions in which they seek to concretely contribute to improving the human condition. They have evidenced a strong humanitarian concern and sense of social responsibility in their lives after graduation. For example, ninety-six percent of the CNR graduates in the Follow-Up Study are actively involved in either their paid, or un-paid, work in the understanding and resolution of environmental problems and related issues in the public interest.

Large numbers of graduates (approximately 40 percent) are working in environmentally related professional positions with local, county, regional, state, and federal government agencies. A substantial percentage of CNR graduates (again approximately 40 percent) have entered careers where all, or a major portion, of their time is devoted to public education in diverse settings, for all ages. Others are developing or already applying advanced knowledge and research competencies in many environmentally related areas. Specifically, we find a physician heading a southern rural health clinic focused on preventative medicine as part of a larger cooperative rural development project; lawyers working in environmental law and with the urban poor as members of public interest law firms; a person in charge of environmental affairs for the California Public Radio Network; an environmental health and safety educator with an international union; a person developing internationally acclaimed recreation and environmental education programs for the disabled; a scholar researching and writing a book on traditional agricultural forms and their implications for contemporary agricultual problems around the world; a scholar studying complex demographic and developmental issues in Latin America; a high-level information specialist with the U.S. Forest Service; planners at all levels of government; educators in public schools, community colleges, colleges, and

universities; and persons employed by national and international environmental and development groups.

The pages of this section examine in detail the advanced education, careers, and lives of CNR graduates that provide the extensive data from which the above, and many additional, conclusions are drawn. Where relevant data are available, CNR graduates are compared with U.C. graduates from other baccalaureate programs.

Outline - The Advanced Education, Careers, and Lives of CNR Graduates with Comparative Data for U.C. Graduates in General

1) The Basic Data: CNR Graduates and U.C. Graduates

2) Further Education and Careers of Graduates with Advanced Education

3) Careers and Jobs of Graduates without Additional Degrees or Certificates

4) Career and Job Satisfaction of Graduates

Section 1) The Basic Data: Education and Later Studies, Careers, and Lives

Sources: CNR Follow-Up Study ('80) [N=217: Women-101, Men-116]
U.C. Graduate Survey ('78) [N=2,198: Women-899 Men-1,299]

1) Employment: General

A) CNR Graduates: Ninety-nine percent (99%) of CNR's graduates are employed at least part time, or pursuing full-time advanced studies.

B) U.C. Graduates: Ninety-seven and one-half percent (97.5%) of U.C.'s graduates are employed at least part time, or pursuing full-time advanced studies.

2) Relationship of CNR program to life in general

A) Ninety-eight percent (98%) of CNR's graduates stated that the understanding and solution of environmental problems was important to them in their lives.

B) Ninety-six percent (96%) of CNR's graduates stated that they were actively involved in the understanding and solution of environmental problems in either their paid, or un-paid work, or in their advanced degree programs.

3) Relationship of work or advanced education to undergraduate program

A) Ninety-one percent (91%) of CNR's graduates stated that the understanding and solution of environmental problems was related to their current work or studies (78% closely; 13% moderately).

B) Did you acquire knowledge or skills as an undergraduate at Cal which are of value in your work or studies now?

-CNR graduates .....YES - 96%

-U.C. graduates .....YES - 75%

4) Satisfaction with Career or Developing Career

A) Are you satisfied with your current or developing career or work?

-CNR graduates (total sample).....mean=4.25*
(5)48%; (4)35%; (3)12%; (2)4%; (1)1%

-CNR graduates (women).....mean=4.24*
(5)51%; (4)30%; (3)12%; (2)5%; (1)2%

-CNR graduates (men).....mean=4.26*
(5)45%; (4)40%; (3)11%; (2)4%; (1)0%

B) Overall, how satisfied are you with your -

-job working conditions?

-U.C. graduates (total sample).....mean=3.66**
(5)25%; (4)36%; (3)24%; (2)9%; (1)6%

-U.C. graduates (women).....mean=3.55**
(5)22%; (4)34%; (3)27%; (2)10%; (1)7%

-U.C. graduates (men).....mean=3.73**
(5)28%; (4)37%; (3)22%; (2)8%; (1)5%

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*CNR: five point scale: (5)extremely satisfied; (4)satisfied; (3)in between; (2)dissatisfied; (1)very dissatisfied

**U.C.: five point scale: (5)very satisfied; (4)satisfied; (3)in between; (2)dissatisfied; (1)very dissatisfied

-future job prospects?

-U.C. graduates (total sample).....mean=3.71**
(5)30%; (4)33%; (3)22%; (2)9%; (1)6%

-U.C. graduates (women).....mean=3.47**
(5)24%; (4)29%; (3)27%; (2)12%; (1)8%

-U.C. graduates (men).....mean=3.87**
(5)34%; (4)36%; (3)19%; (2)7%; (1)4%

5) College Reconsidered

A) Overall Satisfaction

1) All in all, from your present perspective, how satisfied are you now with the education you received in the CNR program?

-CNR graduates.....mean=4.47*
90%-satisfied; 5%-in between; 5%-dissatisfied

2) All in all, how satisfied were you with your total undergraduate experience at Berkeley?[3]

-U.C. graduates.....mean=4.02**
78%-satisfied; 9%-in between; 13%-dissatisfied

B) If you were considering college today with the advantage of your present experience and knowledge, would you-

1) do it all the same?

-CNR graduates.....70% - 85%[4]

-U.C. graduates.....20%

2) change major?

-CNR graduates.....5% - 10%[4]

-U.C. graduates.....30%

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* and **:see note on preceding page

3. *This question tends to get higher ratings than the one CNR graduates were asked. See footnote #2 page 10.*

4. *These are judgements of upper and lower estimates. See note with question #7 page 23.*

Discussion. On every available index CNR's graduates stand absolutely and relatively high. Ninety-eight percent (98%) of CNR's graduates indicated that the understanding and solution of environmental problems had an important place in their lives. Ninety-six percent (96%) said that they were actively engaged in the understanding and solution of environmental problems in the public interest in their work or lives or both. Ninety-one percent (91%) reported that they were involved in their work or advanced studies in the understanding and solution of environmental problems. Thus, the central theme of CNR is an integral aspect of virtually every graduate's life. This is an achievement equalled by few other undergraduate programs anywhere. There is solid documentation that CNR accomplishes its major academic purpose - "the understanding and solution of environmental problems" - as well as preparing and enabling its graduates to utilize it in concrete and productive ways in society. Theory and practice is effectively wedded in a socially responsible manner in the later lives of CNR's graduates.

CNR graduates obtained a broad interdisciplinary education that is also valuable in their current work or studies. Ninety-six percent (96%) of CNR's graduates, compared to seventy-five percent (75%) of U.C. graduates in general, find their knowledge and skills obtained at Berkeley of value in their current work or studies. Thus, CNR graduates, to a significantly greater degree than other U.C. graduates, have been able to use their education directly in their careers or developing careers. This succes is also contrary to current national trends that we previously noted.

CNR graduates are generally satisfied with their developing careers. Eighty-three percent (83%) of CNR's graduates are satisfied with their developing careers, compared to sixty-one to sixty-three percent (61% - 63%) of U.C. graduates in general, responding to similar, but not identical questions. Eighty-one percent (81%) of CNR women are satisfied, compared to eighty-five percent (85%) of CNR men; while fifty-three percent and fifty-six percent (53% and 56%) of U.C. women are satisfied, compared to sixty-five and seventy percent (65% and 70%) of U.C. men who are satisfied with their current work, careers, or developing careers.

CNR graduates, in retrospect, are quite satisfied with the education they received in CNR. Ninety percent (90%) of CNR's graduates were satisfied with their education, while seventy-eight percent (78%) of other U.C. graduates indicated they were satisfied in response to a question that tapped their entire Berkeley experience, rather than just their major program, hence yielding a larger positive response (see footnote #2 page 10). About eighty percent (80%) of CNR's graduates, compared to about fifty percent (50%) of U.C. graduates in general, would do their undergraduate education essentially the same if they had it to do over again (see question #7 page 23).

In conclusion. The opportunity to construct one's own educational program with guidance and support in a participatory community that was developed and is maintained collectively by students, faculty, and staff has proved significantly more effective than traditional programs, taken as a whole, when judged against post-graduation critieria.

Section 2) Further Education and Careers of Graduates with Advanced Education[5]

Sources: CNR Follow-Up Study ('80)
U.C. Graduate Survey ('78)

1) Earned or studying for an advanced degree or credential in a college or university

-CNR graduates...45% [52% of the women; 40% of the men]

-U.C. graduates..58% [55% of the women; 62% of the men]

2) Earned or studying for advanced degrees in graduate or professional schools (see tables 1 and 2)

-CNR graduates...39% [43% of the women; 36% of the men]

-U.C. graduates..51% [43% of the women; 57% of the men]

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5. *Questionnaires for CNR Follow-Up Study were collected in 1980; those for the U.C. Graduate Survey in 1978. The use of U.C. graduate data in this, and all similar comparisons, assumes that after the first year post=baccalaureate, the increase in percentage of persons completing or enrolled in advanced degree programs as a function of the number of years since receiving the baccalaureate degree, follows a gradual (linear) progression. All available data in the literature confirms this assumption. General data on post-baccalaureate education also shows, expectedly, that a significant portion of undergraduate degree holders wait one or more years before entering advanced degree programs (e.g. in U.C. Graduate Survey 61% of the class of 1971; 53% of the class of 1974; and 36% of the class of 1977 respectively had completed or were enrolled in advanced degree programs). Therefore, the percentages for both CNR graduates and U.C. graduates are significantly smaller than what they will eventually be. The percentages who will eventually receive advanced degrees are difficult to predict as they are affected by changing conditions, especially at the present time - social, economic, and other known and unknown factors.*

3) Recent vs. earlier graduates: earned or studying for advanced degrees in graduate or professional schools

-Recent

-CNR graduates 1976 to 1979 (one to four years after)
-38% [42% of the women; 34% of the men]

-U.C. graduates 1974 and 1977 (one and four years after)
-44% [37% of the women; 49% of the men]

-Earlier

-CNR graduates 1971 to 1975 (five to nine years after)
-41% [43% of the women; 39% of the men]

-U.C. graduates 1971 and 1974 (four and seven years after)
-58% [49% of the women; 63% of the men]

4) Earned or studying for advanced degrees in graduate schools (see Table 1)

-CNR graduates...27.5% [29% of the women; 27% of the men]

5) Earned or studying for advanced degrees in professional schools (see Table 2)

-CNR graduates...11.5% [14% of the women; 9.5% of the men]

6) Earned or studying for teaching or nursing (BS/RN) credentials in colleges or universities (see Table 2)

-CNR graduates...6% [9% of the women; 3.5% of the men]

Discussion. Three noteworthy findings emerge from these data: 1) CNR graduates enter a wide variety of graduate and professional school programs; 2) A smaller percentage of CNR graduates than U.C. graduates were enrolled in, or had completed, advanced degree programs; however, for more recent graduates the differences are much smaller; 3) A larger percentage of CNR's women graduates than men graduates go on for advnaced degrees; whereas for U.C. graduates, a larger percentage of men than women go on for advanced degrees.

1) Diversity. It is unlikely that graduates from any other program on campus go into such widely divergent advanced degree programs as do those from CNR. At first glance it is difficult to believe how a single undergraduate program could prepare persons for graduate programs in - physics, sociology, computer science, recreation, medicine, developmental studies, natural resouces,

TABLE 1

PhD or Master's Degree programs completed or in progress*

Field	PhD's					Master's					Totals		
	C	Ip	W	M	Tot	C	Ip	W	M	Tot	W	M	Tot
Natural and Life Sciences	0	2	0	2	2	2	1	2	1	3	2	3	5
Natural Resources (incl.marine & atmospheric)	0	11	7	4	11	2	3	3	2	5	10	6	16
Public Health (incl.environmental)	0	4	2	2	4	0	0	0	0	0	2	2	4
Social Sciences	0	3	2	1	3	1	1	0	2	2	2	3	5
Geography	1	2	1	2	3	0	0	0	0	0	1	2	3
Environmental Engineering	1	0	0	1	1	0	1	0	1	1	0	2	2
Sanitary Engineering	0	2	0	2	2	0	0	0	0	0	0	2	2
Planning (incl.urban coastal,regional)	0	0	0	0	0	2	4	2	4	6	2	4	6
Landscape Architecture	0	0	0	0	0	1	2	2	1	3	2	1	3
Architecture	0	0	0	0	0	2	1	2	1	3	2	1	3
Physics	0	1	1	0	1	0	0	0	0	0	1	0	1
Developmental Studies	0	0	0	0	0	0	0	1	0	1	0	1	1
Education	0	0	0	0	0	2	2	2	2	4	2	2	4
Recreation	0	0	0	0	0	2	0	2	0	2	2	0	2
Film	0	0	0	0	0	0	1	0	1	1	0	1	1
Computer Science	0	0	0	0	0	1	1	1	1	2	1	1	2
TOTALS	2	25	13	14	27	15	18	16	17	33	29	31	60

Key: C =completed; Ip = in progress; W = women; M = men
Total sample: W=101; M=116

* Graduates who have received Master's degrees in-route to PhD's are not included in Master's degrees listed. Therefore, each entry on this table is a separate individual.

TABLE 2

Professional School Programs Completed or in Progress

	Degree Programs				
Field	C	Ip	W	M	Tot
Physicians	4	7	8	3	11
Chiropractor	1	0	0	1	1
Optometrist	0	1	0	1	1
Lawyers	8	3	6	5	11
Rabbi	1	0	0	1	1
Totals	14	11	14	11	25
	Credential Programs				
Field	C	Ip	W	M	Tot
Teachers	7	0	4	3	7
Nurses (RN/BS)	2	4	5	1	6
Totals	9	4	9	4	13

Key: C = completed; Ip = in progress; W = women; M = men
Tot = totals

law, and many more fields. Yet CNR has, and from the reports of its graduates in these programs, done it quite well. The narrative data throughout this study examines the experiences of many of these persons. In each instance there is a strong case made for CNR's flexibility and interdisciplinary approach, along with its theme of understanding and solving environmental problems. Persons have brought to these diverse fields the intent to use them to focus on various aspects of environmental problems as part of their work. Person after person describes why preparing for a particular advanced degree program through CNR was superior for their purposes, relative to following the normal routes to these graduate programs. Many stated that it was only through CNR that they could have accomplished what they did. It is critical to note that a substantial portion of CNR graduates in advanced degree programs stated that their internships and/or other community involvements were important factors, often the decisive factor, in gaining admission to the graduate or professional schools of their choice, as well as in winning scholarships, fellowships, and grants. The importance of this is verified in a recent nationwide survey of admissions counselors who rated community involvement, especially when related to career goals as in CNR, second only to academic achievement in the weight accorded to it in admissions decisions.[6]

A few examples follow of the advanced degree programs CNR students have entered, and their areas of specialization within them. Additional examples can be found in the narrative data throughout this report, particularly in the section on Interdisciplinary Studies.

-A 1976 graduate (male) who integrated many aspects of nutrition, education, health, and biological sciences together to develop a focus on food and hunger issues, is now a fourth year graduate student in genetics at U.C. Davis. He is specializing in 'genetic conservation' and its applications to the protection of rare and endangered plants and animals. At the same time he is serving as chairperson of the Davis Hunger Project Committee.

-Another good example is the woman (1977) completing her PhD in sociology (demography) at the University of Southern California doing research on 'racial and ethnic conflict, income distribution, and economic development in Latin America.' She states that, "*my concerns are the analysis and promotion of development (not Westernization) in Latin America. ...it was only through the CNR major that I could study demography/population studies as an undergraduate.... I went into grad school (University*

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6. *Synergist, National Center for Service Learning - ACTION, Washington D.C., Spring 1981, 56pp.*

of Chicago, later U.S.C.) far better prepared than anyone else in the field of population."

-The young woman (1976) who has become a leader in her field, recreation for the disabled, states: "*My knowledge of recreation planning has proved to be far better* (as the result of her program in CNR) *than that of recreation students who had a more traditional education program.... When compared with Master's and PhD students from all over the United States, my accomplishments, which I achieved as a CNR student, proved to be of more importance to those giving educational grants to recreation students. Thus, I am now the recipient of my third scholarship since graduation.... I was elected as the only U.S. student representative to the World Leisure and Recreation Conference in Berlin in June 1980."*

-One more example is the woman (1976) who has a Master's degree in Public Health from Johns Hopkins University and is currently a fourth year medical stuent at U.C. San Francisco. She is emphasizing preventative medicine and in the midst of her demanding program finds time to work as a volunteer in the 'Workers Clinic' at San Francisco General Hospital. It was only through CNR that she could develop her Area of Interest - "*The Ecology of Health and Disease - with a focus on a systems approach to disease prevention, especially in the areas of occupational, social, and environmental aspects of health and disease.*" She has nothing but praise for her CNR education and states: "*I had a good idea of the direction I wanted to take, and I ended up with a solid, coherent body of knowledge....*" About CNR's advisors, she states: "*...some of the best guidance I've ever recieved. I certainly feel priviledged to have had this kind of advice in an institution which otherwise treats undergraduates in an impersonal manner.*"

-Finally, a 1978 graduate completing her PhD in Agriculture at U.C. Davis whose undergraduate Area of Interest was, "*Bio-Geography - the uses of, and changes in, vegetation in a specific area over time.*" As an undergraduate she did an internship doing field research in Guatamala studying traditional Mayan agricultural practices. She remarks that this, "*meant everything to me...(it) got me into graduate school...gave me confidence....* About the importance of CNR's flexibility, she states: "*Totally! I needed something to validate my approach to my education, and to allow me almost total control. My interests were such that as an undergraduate they couldn't fit into anybody's set boxes. CNR allowed me the freedom to develop them....*" How does her current work and research relate to environmental problems? She comments: "*I am studying traditional agricultural forms...in the hopes that some of the traditional methods can be recognized and used by 'more developed' countries. The book I'm co-authoring* (with the support of a government grant) *addresses itself to the problems and solutions traditional agriculture, throughout the world, provides.*"

These examples illustrate the range of CNR students' interests and the unique contribution their CNR education made to their preparation for advanced studies where they continue to pursue and refine these interests. The intermingling of people with such diverse interests, knowledge, and skills in the cooperative learning atmosphere of the CNR community enriches the educational environment and learning possiblities for everyone - students, faculty, and staff alike.

2) Percentage of graduates, CNR and U.C., who have completed or are enrolled in advanced degree programs. Thirty-nine percent (39%) of CNR's graduates (43 percent of the women and 36 percent of the men) have earned, or are studying for, advanced graduate school or professional school degrees; compared to fifty-one percent (51%) of U.C. graduates at large (43 percent of the women, and 57 percent of the men). This reflects a twelve (12) percentage point spread between the two groups, entirely accounted for by the difference between the percentages of men in each group going on for advanced degrees. The important sex differences revealed in this data will be discussed in the next part of this section. Though the data for other programs are not very complete, the proportion of CNR graduates going on to advanced education appears to be comparable to that of graduates from other professional school baccalaureate programs on campus that have the possibility of leading directly to a specific job market (e.g. business, forestry, engineering, etc.). Graduates form 'academic disciplines', in sharp contrast, are virtually compelled to go on for advanced education if they desire careers that significantly draw on their disciplinary knowledge and skills.

When we compare recent CNR and U.C. graduates, the picture changes significantly. Thirty-eight percent (38%) of CNR's graduates (42 percent of the women, and 34 percent of the men) from the classes of 1976 through 1979 (one to four years after graduation) had completed, or were enrolled in, advanced degree programs; compared to fourty-four percent (44%) of the U.C. graduates (37 percent of the women, and 49 percent of the men) from the classes of 1974 and 1977 (one and four years after graduation). A six (6) percentage point difference between CNR and U.C. graduates. The nature of this significant reduction in the difference between the percentage of CNR graduates and U.C. graduates in general who have earned, or are studying for, advanced degrees will become clearer when we examine the earlier graduates from each group. Fourty-one percent (41%) of CNR graduates (43 percent of the women, and 39 percent of the men) from the classes of 1971 through 1975 (five to nine years after graduation) had completed, or were enrolled in, advanced degree programs; compared to fifty-eight percent (58%) of the U.C. graduates (49 percent of the women, and 63 percent of the men) from the classes of 1971 and 1974 (four and seven years after graduation). This indicates a seventeen (17) percentage point difference between the two groups. Thus, we find an eleven (11)

percentage point reduction in the difference between CNR graduates and U.C. graduates in general who have earned, or are studying for, advanced degrees form earlier to more recent graduates.

Thus, for comparable recent four-year post baccalaureate periods 38 percent of CNR graduates and 44 percent of U.C. graduates had completed, or were enrolled in, advanced degree programs. For example, the women in the CNR sample moved from 6 percent fewer than U.C. women to 5 percent more; while the men in the CNR sample moved from 24 percent fewer than U.C. men to 15 percent fewer. For an overall reduction of 11 percentage points in the difference from earlier to more recent graduates. Therefore, the largest part of the difference in percentages going on to advanced degree programs between CNR and U.C. graduates can be attributed to CNR graduates from the earlier years, especially the men.

The percentages of these recent graduates, CNR and U.C., going on to advanced degree programs will continue to increase, as in the past; and the proportion of CNR graduates compared to U.C. graduates should not alter substantially. However, it can not be known for certain if the declining percentages of U.C. graduates going on to advanced degrees (1971-61%; 1974-53%; 1977-36%) is entirely a function of time since the baccalaureate degree. It may well be related, in part, to the worsening economic condition and increasingly restricted job opportunities in many fields.

Thus, it can be predicted with considerable confidence that a substantially greater percentage of recent CNR graduates (1976-1979) than earlier CNR graduates (1971-1975) will eventually earn advanced degrees. Furthermore, the percentage of CNR graduates earning advanced degrees will not be markedly less than the percentage of U.C. graduates earning advanced degrees.

This reflects a large increase, in recent years, in the percentage of CNR students who choose to pursue their academic and professional studies in greater depth through advanced education after graduating from CNR. The causes of this shift are not completely obvious. A number of reasonable conjectures can be made from sustained observations within the CNR program over a period of years. The climate within the CNR community has altered considerably over time. At the same time the climate surrounding environmental issues and the world situation has changed markedly since the early '70's. The years immediately after 'Earth Day' in 1970 were full of optimism and considerable naivete with respect to the possibility of solving environmental and world problems. Similarly, the political and economic situation during that period were more conducive to hope as 'environmentalists' in the United States won some major struggles. The conditions with respect to environmental problems, the economy, the political situation, and world stability have steadily deteriorated since

the mid '70's to their current rather bleak state.[7]

During this same period of time the CNR program has become, in its own unique manner, much more substantial - through the addition of three permanent faculty, and the development of more explicit structures within the CNR community, particularly in the student body. These external and internal changes have obviously been interactive. As environmental problems refused to yield readily to the 'environmental movement' CNR responded, especially its students.

Two major understandings emerged with greater force than before. First, that solutions to local, national, and global problems were interrelated, and not obvious, as many had naively believed. The need for more knowledge and deeper understanding became apparent and increasing numbers of CNR students began to seek it. Second, it also became dramatically apparent (e.g. the oil crisis, etc.) that the solution of environmental problems was, at least, equally dependent on economic, social, and political factors, as on scientific and technical knowledge and solutions. The CNR program, especially its students, took this understanding to heart, and began in much greater numbers to study economics and political science both in theory and practice, still within a broad interdisciplinary context. This study documents the fact that CNR students and graduates have accepted the challenge of "understanding and solving environmental problems" as a 'complete' concern. That is, working to solve problems in fact, not simply in theory. Problems 'in-the-world' demand broad transdisciplinary understanding of all their aspects - scientific, economic, political, social, cultural, psychological, historical, etc. - if appropriate solutions are to be actually achieved. This is the difficult and critical challenge increasing numbers of CNR students and graduates have accepted. This is in marked contrast to U.C. undergraduates in general who have been characterized as 'apathetic' in recent years, though this too appears to be changing.

Simultaneous with the increase in serious attention to relevant studies, CNR students have become much more involved in their communities at all levels, including the political, in their efforts to improve their understanding and effectiveness as problem solvers. We now find many CNR students and graduates in responsible leadership roles in the public interest, on campus, in Berkeley, and throughout the country (e.g. in the past two years, CNR graduates have been name 'Fireman of the Year' in Oakland, 'Eminent Tennessean of the Year', and nominated for the

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7. For example see, Alan S. Miller, Environmentalism in the Eighties: The Reagan Decade, March, 1981 (23 pages: unpublished manuscript)

national honor of 'Woman of the Year'). Locally, Berkeley's energy self-reliance program, and the current Energy Self-Reliant Year (1981), which has been hailed across the country as a model for the nation, is almost totally the work of CNR students and alumni who laid the ground work back in 1978, and have followed through to the present (see section on "CNR's Contributions to the Community" for a more detailed discussion). This type of hard 'real world' experience has led many CNR students and graduates to more serious and in-depth studies in their efforts to understand the world as they encounter it, and to genuinely contribute to the solution of environmental and associated problems.

Therefore, while CNR students in the early 70's tended to be typical representatives of what has been called the 'me' decade, and naively enthusiastic about the ways of environmental problems, their contemporary counterparts have been transformed into far more serious minded students. This is attested to, in part, by greater percentages going on to advanced studies. As socially responsible members of their many communities, they usually continue with a deep commitment to the democratic process that was either developed or furthered by their experiences in CNR. In this effective combination of serious study (theory) and responsible community participation (practice), CNR has become a leading program in the country. CNR graduates who go on to advanced degree programs do not tend to loose this ability to wed theory and practice into socially responsible action in the world, as the narrative data throughout this study amply documents.

In summary, the CNR program, and its members, have become more serious, concerned, and focused in recent years in response to changing world conditions, and as a result of changes within the program, that have been interactive. Thus, in taking their studies more seriously in keeping with their increased need to know, many more CNR graduates are choosing to enter advanced degree programs than before.

3) Women versus men entering advanced degree programs. A higher percentage of women than men CNR graduates eventually go on to advanced degree programs (43% of the women; 36% of the men), in marked contrast to U.C. graduates in general (43% of the women; 57% of the men). We have already noted how the percentage of CNR graduates who will eventually go on to advanced degree programs has steadily increased over the years relative to the percentage of U.C. graduates. The percentage of CNR women who will eventually go on has increased at a faster rate than that for CNR men (1971-1975: women 43%; men 39% :: 1976-1979: women 42%; men 34%). In recent years a higher percentage of CNR women graduates than U.C. women graduates will eventually go on for advanced degrees (CNR women:1976-1979, 42%; U.C. women:1974 and 1977, 37%; both one to four years after graduation); while a smaller percentage of CNR men than U.C. men will eventually go on (CNR men:1976-1979, 34%; U.C. men:1974 and 1977, 49%; both one to four years after

graduation). Thus, as the percentage of women in the CNR program relative to men increased (1971-1975 = 42% women; 1976-1979 = 49% women; current enrollment (1981) = 58% women), the percentage of CNR women preparing for and eventually going on to advanced degree programs also appears to be increasing significantly, if previous general trends for entering advanced degree programs hold (i.e. percentage entering advanced degree programs increases as a function of the number of years since receiving the baccalaureate).

Women and men are distributed relatively evenly among a wide variety of graduate and professional school programs (see Table 1 and 2, this section). The disciplines and professions that are most logically related to CNR's emphasis on the understanding and solution of environmental problems frequently lead CNR women, at an equal or greater rate than CNR men, into traditionally male fields. For example, the graduate degree programs most frequently entered by CNR graduates, Natural Resource and Life Sciences (35 percent of CNR's alumni who have completed, or are enrolled in, graduate degree programs), were chosen more frequently by CNR women graduates than CNR men graduates (57% women, 43% men). Graduate programs in these areas on the Berkeley campus have, on the average, less than twenty-five percent (25%) women enrolled in them, and an even smaller percentage of women actually complete their degrees, especially PhD's.[8] On the Berkeley campus, approximatelyy 33 percent of the graduate students are women, and 66 percent are men.[9] We find CNR women graduates enrolled in, or having completed, PhD programs as frequently as CNR men graduates (13% of CNR's women graduates, and 12% of CNR's men graduates). Whereas campus-wide we find a much smaller percentage of women than men in PhD programs (26% women), and Master's degree programs (35% women). In addition to smaller percentages of women enrolled in graduate degree programs than men, we find the retention rate (those who actually remain in graduate programs until they earn degrees) for women is substantially lower than it is for men, particularly in PhD programs.[10] Though only a small number of CNR graduates in the follow-up study who had entered graduate degree programs had actually completed them at the time of the study (17 or 28 percent), more women than men had completed their graduate degree programs (34% of the women, and 23% of the men). It can be safely inferred from this data that the retention rate of CNR women is, at least, as high as it is for CNR men in graduate degree programs; even though most of the programs are traditionally male dominated fields where the retention rate for women is normally substantially lower than it is for men. The

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8. *University of California, Berkeley, Women Students at Berkeley: Views and Data on Posible Sex Discrimination in Academic Programs, June 1977*

9. *Berkeley: Office of Student Research, A Profile of the Berkeley Campus Student Mix; January 7, 1981*

10. *Women Students at Berkeley; op.cit.*

pattern found in CNR graduates enrolled in, or having completed, professional schools is similar to that for graduate degree programs. Fifty-six percent (56%) of CNR graduates who are enrolled in or have completed, professional degrees are women (see Table 2, this section). For example, eight of the eleven CNR graduates who are, or are becoming physicians are women; six of the eleven who have entered law are women. Both of these professions remain male dominated.[11]

These data support a number of significant and established theories concerning women and education, especially when examined in light of available research, and the overall situation for women versus men across the Berkeley campus. The findings provide documentation of the later positive effects of CNR's relatively egalitarian and cooperative educational climate which has been, at least, as supportive and encouraging of the educational and career aspirations of women as men. This is clearly not the case for most campus programs as can be readily inferred from the data in the report on Women Students at Berkeley previously cited. The fact that women, on the whole, tend to learn significantly better in a cooperative rather than a competitive setting has been known for a long time, and is frequently reflected in the structure and process of Women's Studies programs.[12] The data from the CNR program suggests that providing a cooperative and supportive learning community enables women to enroll in traditional courses elsewhere on campus and persist and do better in them than they would have otherwise. The CNR data further indicate that we can approach equity in participation in the educational system by creating the kind of climate that allows both women and men to most fully realize their potentials - an egalitarian and cooperative one; rather than maintining a climate that is biased in favor of men - a hierarchical and competitive one. This also enhances women's likelihood of entering and persisting in traditionally male dominated advanced degree programs.

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11. *Ninety-one percent (91%) of the physicians in the United States are men. In 1978 only 25 percent of first year medical students were women. See Mary R. Walsh, "The Rediscovery of the Need for Feminist Medical Education", Harvard Educational Review, Vol. 49, No.4, Nov 1979, pp. 447-466. For the years 1972-1973 through 1975-1976 the average enrollment of women in Boalt Law School was 30 percent (27 percent of the graduates were women during the same period). See Women Students at Berkeley, op.cit.*

12. *See Gloria Sassen, "Success Anxiety in Women: A Constructionist Interpretation of its Source and Significance", Harvard Educational Review, Vol. 50, No.1, 1980, pp 13-24; Florence Howe, Seven Years Later: Women's Studies Programs in 1976, National Advisory Council on Women's Educational Programs, 1977; National Institute of Education Monographs listed in Women's Studies Newsletter, National Women's Studies Association, Fall 1979*

When we examine programs campus-wide, further possible interpretations emerge. Those programs that have fifty percent or more women in their undergraduate components tend to have high percentages of women in their graduate programs as well, but not as high as in their undergraduate programs. However, those undergraduate programs with high percentages of women whose graduate programs do not lead to positions generally open to women have relatively smaller percentages of women in their graduate programs compared to their undergraduate programs, and low retention rates for women relative to men (e.g. psychology, anthropology, sociology, etc.. Graduate degrees in these programs lead principally to academic posts where women are notoriously under-represented.). While those fields where graduate degrees lead to positions generally open to women tend to maintin high percentages of women in their graduate programs, and have equally high retention rates for men and women (e.g.nutritional sciences and public health).[13] Therefore, the usual explanation that the problem lies with the women, rather than with the programs's and the job market's interaction with women, does not account for the differences observed between the two types of programs described above. Two sets of interrelated discriminating factors emerge as reasonable explanations: first, in those fields generally not open to women, the subtle and not so subtle discrimination that led to small percentages of women faculty members in programs with large undergraduate enrollments of women discourage women from entering graduate programs in these areas, and from remaining in them, once enrolled, until they complete their advanced degrees; secondly, the objective conditions of the job market for women in these fields tend to discourage them from entering graduate programs in the first place. In contrast, those fields generally open to women have a much higher percentage of women on their faculties, and hence provide better support for women, and a greater likelihood that they will be able to develop a genuinely collegial relationship with at least one faculty member, along with better job possibilities after attaining an advanced degree.

The tragedy of the situation in those academic disciplines with relatively high undergraduate and low graduate enrollments of women (e.g. sociology: undergraduate enrollment 57% women; while only 23% of the PhD recipients are women[14]), is that there is no substantial job market in these fields for persons with a baccalaureate degree, especially since the precipitous decline in the availability of teaching positions in the public schools. Thus, a much larger percentage of women alumni from these under-

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13,14. *Women Students at Berkeley, op.cit.; for further background on this important issue see Change, Eds., Women on Campus, the Unfinished Liberation; Change Magazine Press, New Rochelle N.Y., 1975, 256pp.*

graduate programs than men alumni will enter the job market with Bachelor's degrees and be frustrated in their attempts to find work related to their education and interests. This takes on considerable added significance when we realize that women who have earned, or are working for, advanced degrees tend to be much more satisfied, on the average, with their careers or developing careers than women who have not gone on to advanced degree programs; while the difference in satisfaction between men with and without advanced degrees is much smaller though in the same direction (see later section of job staisfaction). The toll of the web of discrimination agianst women continues as the forces that discourage women from entering, and completing, advanced degrees are still with us, and the availability of equity in career opportunities remains unrealized.

What is of interest relative to CNR graduates, is that CNR women appear to be cracking the discriminating aspects of the patterns described above, not only in graduate programs where there are large enrollments of women at the undergraduate level, but also in traditionally male fields at both the undergraduate and graduate levels. CNR women are entering male dominated graduate programs more frequently than CNR men, and seem to be completing them at a rate, at least, equal to that of CNR men, though the retention data is not yet very substantial. Thus, it can be reasonably assumed that the retention rate for CNR women in advanced degree programs may well be equal to that of men in the same programs. If this assumption is proved to be true, and we have every indication that it will be, then the CNR program has even greater implications for developing genuinely equal educational opportunities for women at the advanced degree levels than have already been noted and documented. We can reasonably postulate that the cooperative and egalitarian climate in CNR in conjunction with its fostering of independence with responsibility in a democratic structure has enabled women, and men, to develop realistic and well thought through educational and career aspirations. This clarity of purpose combined with self-generated motivation and initiative appears to leave CNR women graduates with the determination and inner strength to choose appropriate advanced degree programs even if they are male dominated, and after enrollment, to withstand the frustrations and discrimination which continue to ensue. Contributing to this persistence is the fact that women, and men, were able to study in these fields as undergraduates from a base of support and encouragement in the CNR community.

Another important finding that emerges from the comparative data between CNR graduates and other graduates will serve to further explicate the findings and analysis offered above. The usual explanation given for the low enrollment of women in traditionally male dominated advanced degree programs is that it "... *is probably attributable to* (a choice) *made much earlier*

in life."[15] Without denying this as a factor, an additional significant influence seems to be operating as well. That is, the ultimate use (professional focus) to which the knowledge in the field is put. For example, CNR women, and men, are entering many traditionally male fields, but generally with a different emphasis than that which is dominant in the field. Thus CNR graduates who enter graduate programs in the natural resource fields tend to have an interdisciplinary conservation focus. These fields are still principally oriented toward extraction and untilization. CNR graduates entering professions tend to have a public interest emphasis much more frequently than those who pursue these fields from traditional undergraduate programs. Thus, CNR graduates become worker's health specialists, family practioners, and environmental lawyers in the public interest, rather than narrowly focused medical specialists and corporation lawyers. The point that emerges is that CNR women, and men, who enter advanced degree programs generally put the knowledge in the field to a different use than is normally the case - that is, to understanding and solving environmental problems in the public interest. We believe that this type of end use contributes significantly to women's choices to embark on careers in areas that remain dominated by men.

CNR men graduates in advanced degree programs. It has been noted that the percentage of men compared to the percentage of women going on to advanced degrees in the CNR Follow-Up Study is not too disparate (36% of the men, 43% of the women); especially when compared to U.C. graduates in general (57% of the men, 43% of the women). However, this difference has increased somewhat over the years. In the early years of the study (1971-1975), four percent more women than men went on to advanced degree programs; while in the later years (1976-1979) eight percent more CNR women than CNR men went on; at the same time the overall percentage of CNR graduates going on relative to U.C. graduates in general increased substantially. It was also noted earlier that all available data indicate that the percentage of CNR graduates going on for advanced degrees is roughly the same as for other undergraduate professional school programs, including other programs in the College of Natural Resources (n.b. data for other programs is sketchy and incomplete.).

Given the above data, the modest differences between men and women from CNR going on to advanced degree programs (7% more women than men), relative to U.C. graduates in general (14% more

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15. *Women Students at Berkeley, op.cit. p.ii. The reasons for such "choices" are anchored in sex socialization and extensive sex discrimination along many dimensions in education at all levels, and in society as a whole. For example see J. Finn, L. Dulberg, and J. Reis, "Sex Differences in Educational Attainment", Harvard Educational Review, Vol 49, No 4, 1979, pp 477-503; and Dick and Jane as Victims, Women on Words and Images Society, Princeton, N.J., 1970.*

men than women), can be pretty much accounted for by the egalitarian and cooperative climate in CNR as previously discussed. That is, the data is within the parameters one would predict from achieving a learning environment which is equally conducive to men and women achieving their educational potentials. There appears to be a trend for an increasing percentage of CNR women, relative to CNR men, to go on to advanced degree programs, along with the increasing percentage of women enrolled in the CNR program, in recent years. This is such that a case can be made with this and previously discussed evidence (see Part VII, Women and Men in CNR) that CNR's support and encouragement of women students has become known in, and beyond, the University community; and hence, has served to attract more women, especially serious and self-directed women. This may, in large part, account for the growing percentage of women enrolled in CNR, and their tendency to excell and achieve leadership positions within the program. there is no evidence that this has discouraged men whose numbers within the porgram have remained fairly constant and who have also frequently achieved distinction.

We find, in summary, that CNR women graduates follow patterns of advanced education more similar to U.C. men graduates than U.C. women graduates, particularly in recent years. That is, CNR women graduates have been able to overcome much of the sexual bias that affects women graduates in general in selecting and persisting in advanced degree programs. Thus, CNR women enter graduate and professional school programs in traditionally male dominated fields at a higher rate than U.C. women in general, and at a higher rate than CNR men. CNR women appear to persist in graduate programs in male dominated fields as well as CNR men, and at a higher rate than U.C. women graduate students in general in male dominated fields (n.b. there is not sufficient data available at this writing to fully affirm this conclusion, but all relevant evidence supports it.). This turn-about from the campus and national norms on the part of CNR women has been linked with the egalitarian, cooperative, and democratic climate that is consciously striven toward in the CNR community.

In conclusion. We have shown in this section on advanced education that CNR graduates pursue advanced degrees in a wide variety of graduate and professioanl school programs at approximately the same rate as graduates from roughly comparable traditional undergraduate professional school programs, though at a lower rate than U.C. graduates in general. In marked contrast to most programs in male dominated fields that percentage of women CNR graduates going on to advanced degrees exceeds that of men CNR graduates, even though most women and men CNR graduates who go on to advanced degrees enter fields and professions that are male dominated. The percentage of CNR graduates who will eventually earn advanced degrees has significantly increased in recent years. CNR graduates tend to turn the knowledge and skills they learn in advanced degree programs to the understanding and solution of

a broad range of environmental problems in the interest of the general public. Thus, as a result of the understanding, knowledge, and commitments developed in the interdisciplinary context of CNR, graduates generally undertake unique thrusts within traditional advanced degree programs that are designed to meet important contemporary societal needs.

Section 3) Careers and Jobs of Graduates without additional Degrees or Certificates (i.e. nursing and teaching credentials)

CNR graduates find employment and develop careers in many diverse fields as a result of their interdisciplinary education with individually chosen Areas of Interest.

- Of the 119 CNR graduates in the Follow-Up Study (women = 49; men = 70) who have entered the work force with their baccalaureate, eighty-four percent (84%; 86% of the women and 83% of the men) report that they are in positions that call for understanding, and contribute to the solutions, of environmental problems. Sixteen percent (16%), or nineteen, are in positions that have little or no relationship to the solution and/or understanding of environmental problems, though many of them (eleven) are active in environmental issues and pursuits in their non-paid involvements. One-hundred and fifteen (115) or ninety-seven percent (97%) stated that the understanding and solution of environmental problems was important to them in their lives.

- Graduates from other U.C. undergraduate programs which encompass most of the range of interests of CNR students (i.e. humanities, social sciences, biological/life/soil sciences, and environmental design) do not do nearly so well in finding jobs related to their undergraduate degrees. Using the employment statistices generated by the U.C. Career Placement and Guidance Center (CPPC) and reported in their recent annual reports, we find: less than one-third of the social science and humanities majors found positions significantly related to their undergraduate degrees (e.g. the positions most frequently accepted were in the "clerical" and "general office" areas); while in the biological/life/soil sciences, and environmental design programs, the percentages finding jobs related to their degrees were higher, ranging from fourty to sixty percent. These statistics are not precise because of the relatively low percentage of graduates that report their placement ot the CPPC, but they are comparable to similar nationwide data on recipients of the baccalaurate degree.

This data in conjunction with the high level of career and developing career satisfaction reported by CNR graduates (see next section on "The Career and Job Satisfaction of CNR Graduates")

provides firm empirical substantiation of the findings reported early in this report about the congruence between CNR students' career and advanced schooling goals and the degree to which they felt the CNR program was meeting them (see pages 14-21). These data also confirm the fact that the majority of CNR students who did not go on to advanced degrees consciously made this choice as students and effectively prepared themselves for rewarding work related to their understanding of, and concern with the solution of environmental problems - broadly defined (see pages 14-21).

Thus, we can conclude that CNR graduates with their interdisciplinary liberal education, with a specific Area of Interest of their choice, do markedly better than various relevant comparison groups in finding work and careers that are related to their undergraduate education without further education.

Perhaps the best way to develop an understanding of the careers of CNR graduates with Bachelor's degrees is to categorize and list their many job titles with the number of persons in each kind of job. This data is drawn exclusively from the CNR Follow-Up Study (1980).

Positions of CNR Graduates with Bachelor's Degrees*

(17) General Environmental Fields - various public and private agencies and organizations

Preparing Environmental Impact Statements(5); Environmental Policy Analysis Consultants(4); Environmental Engineer(1); Waste Water Reclamation Specialist(1); General Environmental Consultant(1); Landscape Architects(2); East Bay M.U.D. Water Plant Operator(1); Flood Control Engineering Staff Assistant(1); Public Health Diagnostician in Virology Laboratory(1).

(19) Professional Planning Positions - various local, county, and state agencies

Urban/rural(10); Transportation(2); Coastal(2); Natural Resource/Land Use(2); Air Resources/Air Quality(2); Recreation Planner(1).

(7) Department of the Interior - National Park Service

Heritage Resource Specialist(1); Planner(1); Environmental

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* Numbers in parentheses ( ), and after each job title, indicate the number of persons in each category and position

Research(1); Naturalist(2); Miscellaneous Position N.P.S.(2).

(9) Department of Agriculture - United States Forest Service

Economic Planner(1); Research Forester(1); Archeology/ Anthropology Technician(1); Biological Information Specialist(1); Soil Scientist(1); Entomologist(1); Hydrologist(1); Visitor Information(1); Young Adult Conservation Corp, U.S.F.S.(1).

(13) Biological and Related Fields - various state and federal agencies

Fish and/or Wildlife Biologists(8); Subsistence Specialist for State of Alaska(1); Soil Conservation Scientist (U.S.D.A.)(1); Assistant Manager, Wildlife Area in State of Missouri(1); Curator, Natural History Museum(1); Botanist(1).

(3) Bureau of Land Management

Wilderness Specialist(1); Environmental Consultant(1); Range Conservationist(1)1

(1) Environmental Protection Agency

Program Analyst for Toxic Substances(1).

(1) California State Parks

Ranger, Interpretive Programs(1).

(1) East Bay Regional Parks

Ranger, Interpretive Programs(1).

(4) Environmental Organizations, Community Groups, and Related

Computer Specialist and Programmer for Environmental Defense Fund(1); Lobbyist for Friends of the Earth(1); Manager of Re-Use Center, Alameda County(1); Specialist in Nuclear Developments in Africa, Africa Resource Center(1).

(6) Energy Related

Consultant to Federal and State Agencies on Energy Policy(1); Energy Consultants, P.G.& E. Residential Conservation Services(2); Manufacturers' Representative for several companies providing Energy Efficient Products(1); Lawrence Berkeley Laboratory, Technical work in Energy Conservation(1); Program Analyst, Energy Research Consulting Firm(1).

(3) Agriculture and Ranching

Farm Manager, U.C. Davis(1); Ranch Manager/Owner(1);

Agricultural Land Developer(1).

(28) Education - Professional Positions in Diverse Settings

Environmental Educators in public and private settings(5); Outdoor Educators in public and private settings(8); Naturalists(2); Miscellaneous Professional Positions in Education including teachers in private schools, educator in Occupational Health and Safety in a labor union, a Recreation Director, community college teachers and program directors, Program Director for U.C. Extension, and a Dean of Continuing Education at a university(13).

(9) Journalism and Related - Print, Radio and Miscellaneous

Editor, Solar Energy Newsletter(1); Co-Director of a news department that has won more awards than any other news program in the country(1); California Public Radio, Public Affairs (Environmental)(1); Technical Writer on Environmental Health and Safety(1); Free-Lance Environmental Writers (full-time)(2); Writer for Advertizing Agency(1); Environmental and Political Theatre (full-time)(2).

(4) Artists and Crafts Persons - professional and full-time

Artists, natural history illustrators, evvironmental muralist(3); Wood worker(1).

(15) Business and Related

Owners of small businesses: Three separate firms involved in the development, manufacture and sales of solar systems, wood stoves, and other appropriate technology(3); Professional Tree Service(1); Whitewater Boating and Fishing Lodge, Rogue River Oregon(1); Herbal Store and Distributor(1); Retail Store(1); Others employed in Business: Personnel Manager of Service Company in the Public Health Field(1); Financial Analyst(1); Assistant Manager, large Mountaineering Store(1); Office Manager(1); Secretaries(2); Stock Clerk(1); Environmentally-oriented Urban Developer(1).

(15) Miscellaneous Fields - not environmentally related

Lieutenant, Oakland Fire Department(1); Pacific Telephone Communications Technician(1); IRS Tax Auditor(1); Real Estate Sales Persons(3); Vista Volunteer(1); Construction Workers(2); Mail Clerk, U.S. Postal Service(1); Flight Attendent(1); Plumber(1); Carpenters(3).

(1)* Unemployed - a significant period of time

Discussion. A number of characteristics stand out when we examine the careers or work of CNR graduates with baccalaureates. First, like their classmates who have gone on to advanced degree programs, they are with few exceptions in socially productive jobs in the public interest. That is, their work contributes, by and large, to the well-being of the environment, people, and society. This is very significant when we realize that only 30 to 50 percent, depending on the definitions used, of the jobs available to the labor pool of baccalaureate degree holders can be considered socially porductive and in the public interest.

Within their occupations, CNR graduates are contributing to the understanding and solution of environmental problems from many perspectives. Professional positions are held in diverse local, regional, state, and federal government agencies by about 40 percent of these graduates. Some 20 percent are in scientific/technical positions related to research. Over 20 percent are in a wide range of environmental impact, planning, or policy positions. Approximately 40 percent are in professional positions where all (about 20 percent), or a major portion (another 20 percent), of their time is devoted to the education of the public about the environment and environmental concerns at all age levels. A close examination of the job titles that have been listed above will provide further details. The careers and how they derived these careers from CNR's education of a substantial number of these persons, have been described in the narrative data throughout this report. Even most of those graduates who are owners or managers of businesses are environmentally orientated, and providing socially useful and beneficial goods and services. For example, an environmentally sound professional tree service, diverse appropriate technology development and sales firms, and even a cooking school with an emphasis on healthy nutrition. A very small percentage of CNR graduates (i.e. less than 2%) have taken work with large corporations or businesses whose products or services are environmentally degrading or not socially productive, or both.

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* These numbers add up to more than 119 graduates in careers with Bachelor's degrees (total positions listed = 160). In several instances persons were between positions, or had just begun a new position. In these instances both jobs were listed. In other instances previous and concurrent jobs of individuals just entering, or in, graduate schools were listed when these positions were principally a function of their undergraduate education. This was done to provide the fullest possible picture of the kind of work CNR graduates were able to obtain as a result of their undergraduate education.

There are few differences in the kinds of positions entered by women and men. Men have more frequently become owners or managers of businesses, while women have more frequently, though in very small numbers, entered office and low-level administrative work. These differences will be discussed in the next section on career satisfaction.

Graduates whose occupations are not directly related to the understanding and solution of environmental problems (9 percent of the total sample in the Follow-Up Study, or 19 persons who comprise 16 percent of the baccalaureate degree holders who entered the work force rather than going on for advanced degrees). These persons, for the most part, valued and put their CNR education to creative use. Because they do not appear often in the previous narrative data, we will describe some of their careers and lives, and how they connect with their CNR education, as well as their efforts relating to the environment outside of their principal jobs.

- A young Philippino man (a 1975 CNR graduate) is a Lieutenant in the Oakland Fire Department. His Area of Interest was "the effect of sports and recreation on people, natural resources, and the environment." In addition to his full-time job with the fire department, he is the director of sales and publicity for Magus Films; he was the associate producer of the film Survival Run which won 22 film festival awards in 1979 and 1980; he was the co-initiator, and continues to be a principle organizer, for the annual "Brass Pole Run" in Oakland, whose proceeds go to the Burn Council, a nationwide burn prevention program; he is the president of the Oakland Dragon Boat Racing Association, and he and his crew raced in the International Dragon Boat Races in Hong Kong in June 1980; he was named"Fireman of the Year" in 1978.

What does his CNR education have to do with this? A great deal. In his own words: *"I started as a P.E. major at Berkeley, but didn't want to be the guy who handed out baseballs and bats to a different group of kids each hour. In my ultimate major of CNR, I explored the effect of values instilled through sports and recreation on people, natural resources, and the environment. I began to discover that everything is interrelated.... Without the major I probably would not have continued my education. The course of study offered to me via CNR opened doors to learning and knowledge. For the first time in my college career, I experienced the drive to inquire about my values and how they affect the environment around me.... The humanity and friendships I encountered are still cherished memories. The direction my life has taken is a direct result of my encounter with the courses and individuals involved with CNR."*

- A young woman (a 1972 CNR graduate) who is a fine wood craftsperson - building custom cabinets and furniture. Her Area of Interest was "environmental education." Though she worked as an outdoor educator (former director of a YMCA "Wilderness Trippers"

program) for awhile, she has found greater satisfaction in developing a master's level of skill in woodworking. She is involved in Friends of the Earth, and is an active member of a small Natural Foods Co-op. Of her education she says: *"I loved CNR.... CNR provides a viable ALTERNATIVE - it provides the opportunity for an individual to define a field of interest and develop a curriculum around it. This is the best way to create new jobs in our society.... I feel unless college offers students a chance to create new jobs - business as usual will continue unchallenged...students will graduate in their defined major not seeing any correlation between economics, sociology, and ecology."*

- A 1974 graduate (male) who owns the "Happy Baker Company" in Tennessee which sells gourmet accessories, kitchen designs, and runs a cooking school. He is at the same time a member of the board of directors of Landmarks Chattanooga - a group devoted to saving significant natural and human-built landmarks in Chattanooga; and the co-author of the Lookout Plateau - Regional Planning Study (his Area of Interest in CNR was land use planning). Recently he was named "Eminent Tennessean of the Eighties" for his contributions to society. In reflecting on his CNR education he states: *"The well-rounded curriculum helped sharpen my interest and confidence in a variety of topics...the* (self) *discipline gained has helped pave the way to success...* (on flexibility in the CNR program) *Imperative! I've felt comfortable about doing a variety of things with my education. I am more well-rounded and don't feel I spent four years that are now irrelevant.... CNR allows students to shape their education preparing them for shaping their careers and future pursuits. The major is truly futuristic, unstatic, ready to meet the problems and demands of our changing world (head-on). Thanks CNR!"*

- A young woman (a 1975 CNR graduate) who is a mail clerk with the U.S. Postal Service. Her Area of Interest was "biogeography, species and habitat conservation." She is a frequent volunteer leader of Birding and Natural History Field Trips for National/ Local environmental organizations; is active with environmental issues; and speaks very highly of her CNR education.

- A young man (a 1979 CNR graduate), currently a stock clerk, who chose a general environmental problem perspective for his Area of Interest - "biological, political, economic, and ethical perspectives." Like many 1979 graduates at the time of the survey, he was looking for what he termed "a socially responsible" environmentally related job. Much of his avocational time is spent in environmentally related activities and projects, including working for the solution of environmental problems with local community groups. He praises all aspects of the CNR program, saying: *"Whatever happens job-wise, I will always treasure the rich experiences and education I have had in CNR."*

These illustrative cases reveal several representative points: 1) these people are deeply involved in their lives in ways that draw heavily on their CNR education, and are making important contributions to their communities (e.g. two of them have been awarded important honors for their contributions to society); 2) those settled in careers are extremely satisfied with them; 3) those in what appear to be dead-end jobs are leading lives of quality and making contributions to their communities, praise their CNR education, and are, with few exceptions, either looking for socially responsible jobs in the environmental field, or saving money to enter graduate school (this is particularly characteristic of a number of recent graduates). Thus, CNR's general interdisciplinary education has led to concrete and important effects on the later lives of CNR graduates whose careers or work is not directly related to the understanding and solution of environmental problems. They have realized may of the explicit goals of a liberal education in their lives.

In conclusion. CNR graduates with bachelor's degrees have found work and careers closely related to their undergraduate education much more frequently than U.C. graduates in general. Virtually all of these CNR graduates are significantly involved with environmental issues in their lives and careers. A large percentage of CNR graduates have actively sought and found work and careers that are both productive and socially responsible in the public interest. An impressive achievement for these times.

Section 4) The Career and Job Satisfaction of Graduates

We have already established that the overwhelming majority of CNR graduates are pursuing advanced degrees or careers that draw heavily on their CNR education, and that they are deeply involved in the understanding and solution of environmental problems. The remaining question that we have not probed extensively is the degree of satisfaction CNR graduates are finding in their work, careers, and developing careers.

The basic data available on this question is presented below:

Satisfaction in current or developing careers or work: CNR and comparison group[16]

A) CNR graduates*

1) CNR graduates - total sample (N=217).....mean=4.25
(5) 48%; (4) 35%; (3) 12%; (2) 4%; (1) 0%

2) Women - (N=101).....mean=4.24
(5) 51%; (4) 30%; (3) 12%; (2) 5%; (1) 2%

3) Women - completed/enrolled in advanced degrees (N=52).....mean=4.67
(5) 69%; (4) 29%; (3) 2%; (2) 5%; (1) 2%

4) Women - no advanced degrees or certificates (N=49).....mean=3.89
(5) 38%; (4) 40%; (3) 20%; (2) 9%; (1) 0%

5) Men - (N=116).....mean=4.26
(5) 45%; (4) 42%; (3) 5%; (2) 4%; (1) 0%

6) Men - completed/enrolled in advanced degrees (N=46).....mean=4.41
(5) 51%; (4) 42%; (3) 5%; (2) 2%; (1) 0%

7) Men - no advanced degrees or certificates (N=70).....mean=4.18
(5) 41%; (4) 40%; (3) 15%; (2) 4%; (1) 0%

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* Are you satisfied with your current, or developing, career/work? (5)Extremely Satisfied; (4)Satisfied; (3)In Between; (2) Dissatisfied; (1)Very Dissatisfied

16. *The question posed to CNR graduates and the questions posed to U.C. graduates were obviously not identical. However, they cover similar ground and hence, comparisons are appropriate when made with due caution. Even when asked a much broader question which alwys yields more positive responses - "How satisfied are you with life in general?" - the mean for U.C. graduates was still significantly below the mean for CNR graduates for career satisfication alone (i.e. U.C. Grad-life in general - mean=4.05: (5)32%; (4)47%; (3)18%; (2)3%; (1)1%). It is also noted that (5) on the scale for CNR graduates was keyed more strongly - "extremely satisfied", than (5) on the scale for U.C. graduates - "very satisfied". The only possible effect of this would be to lower the means for CNR graduates relative to U.C. graduates, and hence further strengthen the analysis made in the discussion, because it would increase the already substantial differences between the two groups.*

B) U.C. graduates*

Are you satisfied with your -

-Job working conditions?

1) U.C.graduates - total sample (N=1999).....mean=3.66
(5) 25%; (4) 36%; (3) 24%; (2) 9%; (1) 6%

2) U.C. graduates - women (N=794).....mean=3.55
(5) 22%; (4) 34%; (3) 27%; (2) 10%; (1) 7%

3) U.C. graduates - men (N=1205).....mean=3.73
(5) 28%; (4) 37%; (3) 22%; (2) 8%; (1) 5%

-Future job prospects?

4) U.C. graduates - total sample (N=2198).....mean=3.71
(5) 30%; (4) 33%; (3) 22%; (2) 9%; (1) 6%

5) U.C. graduates - women (N=874).....mean=3.47
(5) 24%; (4) 29%; (3) 27%; (2) 12%; (1) 4%

6) U.C. graduates - men (N=1274).....mean=3.87
(5) 34%; (4) 36%; (3) 19%; (2) 7%; (1) 4%

Discussion. CNR graduates, in keeping with all of the other findings in this report, are generally quite satisfied with their work, careers, or developing careers (48% extremely satisfied; 35% satisfied). U.C. graduates in general appear to be much less satisfied than CNR graduates (U.C. graduates, 61%-63% satisfied; CNR graduates 83% satisfied). Thus, developing a positive and constructive concern for addressing environmental problems within a broad interdisciplinary education, has led CNR graduates to seek and find socially productive and socially responsible work which is satisfying. This conjunction of career satisfaction and serving the public interest is in marked contrast to the directions and level of career satisfaction found among college graduates in general, and to the current trends in the society and culture of the United States.[17]

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* (5)Very Satisfied; (4)Satisfied; (3)In Between; (2)Dissatisfied; (1)Very Dissatisfied

17. *An excellent critical overview of this issue and current college students and graduates can be found in an article by Leon Botstein, president of Bard College, "The Children of the Lonely Crowd," Change - The Magazine of Learning, Vol 10, no 5, May 1978, pp 16-20*

Satisfaction: Women Versus Men. CNR women graduates are nearly as satisfied as CNR men graduates (CNR women 81% satisfied; CNR men 85% satisfied); while U.C. women graduates are significantly less satisfied than U.C. men graduates (U.C. women 53%-56% satisfied; U.C. men 65%-70% satisfied). While slightly over 80 percent of CNR's women graduates are satisfied, only a little over 50 percent of U.C.'s women graduates in general are satisfied. The difference in satisfaction between CNR men and U.C. men is substantial (approximately 20 percentage points), but is not as large as the difference between CNR women and U.C. women (approximately 30 percentage points). These are substantial and important differences which further confirm the long-range impacts of the relative equality of support and encouragement found within CNR. A more poignant way of expressing these findings is to state that roughly thirty more CNR women than U.C. women out of every one-hundred graduates in each group are satisfied with their later work, careers or developing careers; and similarly roughly twenty more CNR men graduates than U.C. men graduates are satisfied. When we remind ourselves that this data refers to individual lives, its importance is brought home in its proper perspective.

A further breakdown of the data reveals additional significant and informative differences. CNR women who are enrolled in, or have completed, advanced degree programs are substantially more satisfied than CNR women who have not gone on to advanced degree programs (CNR women - advanced degree, 98% satisfied; CNR women - no advanced degree, 68% satisfied). The difference between CNR men graduates who have, and who have not, gone on to advanced degree programs is in the same direction; it is significantly less than for the women (CNR men - advanced degree, 93% satisfied; CNR men - no advanced degree, 81% satisfied). Similar comparative data for U.C. graduates in general is not available. Thus, seeking and obtaining advanced degrees is a much more important factor for women than men CNR graduates in attaining career satisfaction, or the perceived prospects of attaining career satisfaction after the completion of advanced degrees (i.e. the difference for women is 30 percentage points; for men it is 12 percentage points). Conversely, CNR men who enter the work force with their baccalaureate degree are more likely to be satisfied with their work or careers than CNR women who do the same (CNR men - 81% satisfied; CNR women - 68% satisfied); while CNR women enrolled in, or having completed advanced degree programs tend to be somewhat more satisfied than CNR men who have gone on to advanced degree programs (CNR women - 98% satisfied; CNR men - 93% satisfied).

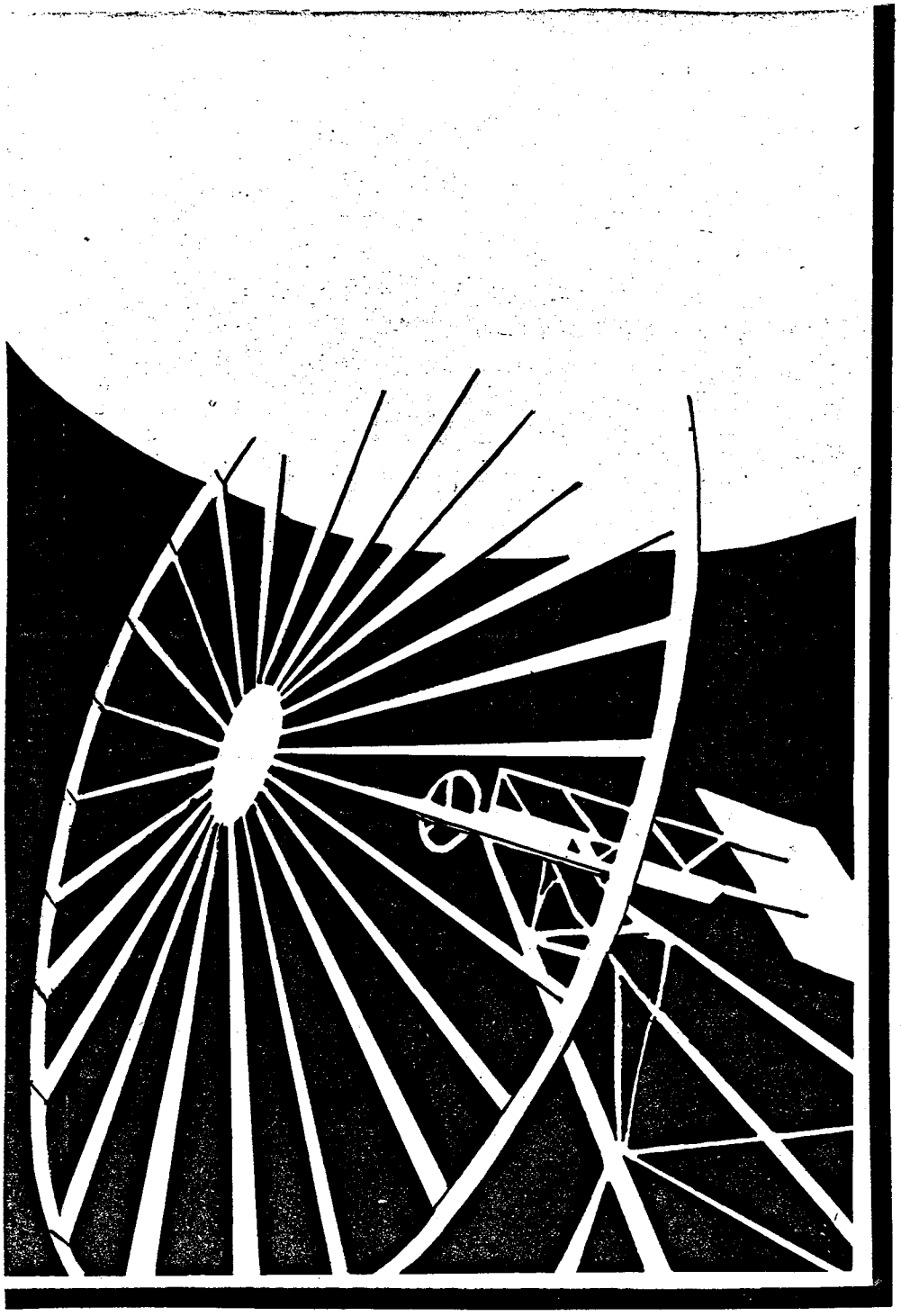
CNR men with baccalaureate degrees have more frequently found satisfying and rewarding work than CNR women with essentially the same training. An examination of the actual working situations of the CNR men and women who are dissatisfied with their current work will further explicate these findings. The women graduates who were dissatisfied tended to be in dead-end jobs typically held by women (i.e. secretaries, office managers, lowlevel technical

jobs, etc.); while the CNR men who were dissatisfied tended to be in transition jobs while waiting to enter graduate school or while actively looking for more appropriate work (e.g. stock clerk, construction work, etc.). Noteworthy is the fact that married CNR women graduates were, on the average, as satisfied with their work, careers, or developing careers as unmarried CNR women graduates. The one area of work that men entered at a much greater frequency than women was as owner and managers of businesses (CNR men - 7%; CNR women - 0%). The data simply reflect the well-documented status of women in the United States work force (i.e. lower level jobs than men with equivalent training, and less pay for the same work). These factors are simply operating among CNR women graduates too, but to a much lesser extent than among college graduates in general. Over half of the women graduates from academic disciplines who enter the work force with their baccalaureate degrees take "clerical," "general office," or low-level "technician" positions.

The significance of these findings, especially with respect to women, should not be underestimated. We can conclude that as a consequence of CNR's relative equality - women are encouraged and supported at least as much as men in their educational and career aspiration - a condition that does not hold in most undergraduate programs; CNR women are much more likely to attain satisfaction in their work, careers, or developing careers than U.C. women in general. In addition, the climate in CNR has enabled women, with increasing frequency, to prepare for and exercise the option which is most likely to lead them to a satisfying career (i.e. entering advanced degree programs). It would seem that CNR women realize, both consciously and unconsciously, that if they are to have the same opportunities as men to develop satisfying careers, they should seek advanced degrees where they are in some ways better equipped to overcome sex discrimination in the work force. Men, as the data clearly indicate, are not under the same compulsion, and this may, in part, account for the smaller percentage of CNR men than women now going on to advanced degree programs. That is, men know they have a good chance of finding satisfying careers without going on to advanced degree programs. Thus, the case could be made, but not confirmed with the data at hand, that the interdisciplinary, democratic, flexible, and supportive environment in CNR allows the realities of the later work world to be more fully influential in persons' sequential choices while in CNR. As a consequence, the series of choices made while in the program - a condition virtually unique to CNR - by women and men are more likely to lead them to satisfying careers than U.C. graduates in general who do not have similar options.

In conclusion. The nature and environment of the CNR program enables the owverwhelming majority of its graduates, both women and men, to find satisfying work, careers, and developing careers.

CNR graduates attain satisfaction substantially more frequently than U.C. graduates in general, especially CNR women graduates in comparison to U.C. women graduates. This section constitutes the final piece of evidence in this report which describes and documents the CNR program in terms of the most essential criterion - the impact of the program on people's lives while in the program and after graduation.



III. Synthesis and Conclusions

WHEN EXAMINED AGAINST CRITERIA DERIVED FROM THE AIMS AND PURPOSES OF THE UNIVERSITY AND THE CNR PROGRAM, THE CONSERVATION OF NATURAL RESOURCES MAJOR IS A TRULY OUTSTANDING AND UNIQUE UNDERGRADUATE PROGRAM. IT IS A REMARKABLE SUCCESS IN BOTH AN ABSOLUTE SENSE, AND IN COMPARISON TO OTHER UNDERGRADUATE PROGRAMS AT BERKELEY. THESE JUDGEMENTS ARISE FROM AN EXAMINATION OF HOW THE PROGRAM HAS AFFECTED ITS STUDENTS AND GRADUATES, AND WHAT THEY HAVE ACCOMPLISHED, IN PART OR WHOLE, AS A CONSEQUENCE OF THEIR EDUCATION IN CNR.

To explicate and synthesize the data and analysis that lead to the above conclusion, we must return to the aims and purposes of education at the University, and in CNR. The stated goals of the University for a liberal and humanizing background, which the University repeatedly reaffirms as the basis for distinguishing an undergraduate education at the University from a vocational training program, are: to understand ourselves, others and nature, and to further the ideals of our democratic society.[1] In recent decades as the University moved away from being an institution for the elite, and with changing economic conditions and job markets, vocational preparation became a more

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1. For example see Angus E. Taylor, University Provost, Undergraduate Education in the University of California; Berkeley, California, December 1975; "(We) reaffirm the primacy of a liberal arts background, a fully articulated experience of humanizing studies, as a prerequisite for all undergraduates in the University of California....", The Entering Undergraduate Student - Report of the Twenty-Ninth All University Faculty Conference; The University of California, Berkeley, 1975, (p.46); and General Education in a Free Society: Report of the Harvard Committee; Harvard University, Cambridge, Mass., 1945.

pressing and legitimate expectation of entering undergraduates. There has been a continuing struggle to achieve an appropriate balance between these competing interests - a liberal arts background and vocational preparation.

The aims and purposes of the University can, thus, be separated into two groups: general educational goals; and preparation for graduate and professional schools, and preparation for a career, or both. Specifically:

General education goals:

1. gaining a thorough understanding of the subject matter
2. providing training in critical thinking and analysis
3. providing broad, general, humanistic (liberal arts) education
4. promoting social responsibility and developing skills useful in the community

CNR students ranked first, among the students of the 40 undergraduate programs surveyed, in the degree of importance they placed on these goals, and the degree to which they judged their program had enabled them to meet their expectations in these areas (see pages 14-18).

Advanced education and career goals:

5. preparation for graduate or professional school, and/or
6. preparation for a career

CNR students, when compared to students in other programs, made relatively realistic choices about advanced education and career goals; and CNR succeeded well, relative to other programs, in enabling them to meet these expectations (see pages 14-21).

Within this framework, the major purpose of the CNR program is: the identification, understanding, and solution of environmental problems through a program of interdisciplinary study and experience.

Philosophy of education. The CNR program, in sharp contrast to undergraduate education in general at Berkeley, reflects a coherent and comprehensive, articulated, educational philosophy

and epistomology.[2] The key interdependent features of this philosophy, in practice, which we have examined at length in this report are: interdisciplinarity, flexibility, practical experience, participatory democracy, and community (see page 3). Thus, the content and form of the program are an interpenetrating and cohesive whole. No educational program can be fully understood without a comprehensive understanding of the whole phenomenon. This study clearly demonstrates that merely considering a course of study (i.e. a discrete set of courses),independent of the mileau in which they exist, ignores several major factors that have a profound impact on people's educations and lives when judged against the stated goals of the University. We have extensively documented the nature and impact of interdisciplinarity, flexibilty (freedom with responsibility), participatory democracy, and community in terms of the University's purposes, especially in achieving the goals of a liberal arts and humanizing background (i.e. the impact on people these are designed to achieve). We have, throughout this study, focused on the commonly agreed upon ends, in terms of how people live their lives, as the ultimate critieria for judging the effectiveness of a University education. In this way we have avoided the common pitfall of solely employing more readily available and proximal criteria (i.e. grade point averages, percentages entering graduate and professional schools, and particualr configurations of courses), whose relationships with more distal or ultimate criteria are negligible or poorly established.[3]

The cornerstones of CNR are the fundamental propositions of a democratic humanism that flow from the ideals of a democratic society - that people (in this instance, students, faculty, and staff) have a right to exist in a humane atmosphere where they are afforded dignity, respect, and equality of worth. The practices which reasonably derive from these propositions - freedom of choice with responsibility, full participation in the decisions that affect

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2. *Martin Trow, Director of the Center for Studies in Higher Education, and current Chair of Berkeley's Academic Senate (1980-1981) correctly states, in our opinion, the general condition at Berkeley:"Berkeley as an institution, has no conception of the educated man, nor any plan for liberal education.... (there is both an) absense of an educational philosophy (beyond laissez faire) and a lack of interest in having one at Berkeley." "Bell, Book, and Berkeley;" Experiment and Innovation: New Directions in Education at the University of California; Vol 1, No 2, January 1968 (p 7).*

3. *For example see David C. McClelland, "Testing for Competence Rather Than 'Intelligence,'" The American Psychologist, Vol 28, No 1 (pp 1-14).*

one's life, and a cooperative community of people dedicated to common goals - are integral aspects of the CNR program. Critical reflection and analysis of the diverse strands of data brought together in this study lead unequivocally to the conclusion that CNR's democratic humanism, and the practices it informs, are the root source of its distinguished success.

The CNR program was founded through the collaboration of faculty and students. The continued growth in the quality of the program, which we have documented, is the result of continued collaboration between students, faculty and staff on an equal footing. The CNR program, in the eleven years of its existence, clearly demonstrates, contravening the conventional wisdom in higher education that a democratic process where students, faculty, and staff work together as equals to create and recreate educational experiences, can lead to the development and continued growth of an exemplary undergraduate program at Berkeley, when judged against the University's stated aims and purposes.

The following passage from a speech by Olof Palme, former Prime Minister of Sweden, puts the principle underlying this achievement in its appropriate larger context:

> "One of the most prominent figures in the history of the Swedish Social Democratic Party, Ernst Wigforss, observed that once you have accepted the principles of democracy, then you can not draw a limit for democracy. 'Once you have openly approved the democratic principle of equality, you can not arbitrarily limit its application to certain areas of life.'
>
> This thought was also expressed in the mid-seventies in a report on democracy in industrial firms by the Swedish Trade Union Confederation: 'For the individual, life is of one piece. There is no sharp line between work, economy, culture, social status, and treatment. Seen from the individual's perspective, the struggle for liberation and equality must be carried on unceasingly within all sectors of social life.' The starting point for our demand for economic democracy is thus the conception of democracy as a desirable value in itself."[4]

Overcoming contemporary problems in higher education

Several contemporary dilemmas in higher education have been substantially overcome in the CNR program.

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4. *Olof Palme in the keynote address on "Economic Democracy" given at the Eurosocialism and America Conference, Washington D.C., December 5-7, 1980. Excerpted in Working Papers for a New Society, Vol 8, No 1, January/February, 1981, p 35.*

Systematic analyses of higher education, in large universities expecially, have developed general critiques which usually deplore the quality of undergraduate education, and frequently contain recommendations for institutional change.[5] These have not historically led to institutional change of any great magnitude. In fact considerable justified pessimism exists about the potential for constructive systemic change. Some quotations from leading educatiors will illustrate this plight:

> "Looking at the record of the past half-century a dispassionate observer would probably have to conclude that major innovations within established universities have depended on strong-minded administrators like Hutchins and Lowell. Once these administrators were gone, the pioneers they brought to clear the departmental jungle were usually driven out too, and the undergraduate landscape reverted to its naturally fragmented and protograduate ecology." Christopher Jencks and David Riesman[6]

> "These recruitment and retention patterns (at Berkeley) have not assembled a large body of men dedicated to undergraduate education.... The most important factor about education at Berkeley is the enormous disparity in the resources - of money, energy, and imagination - that go into undergraduate education as opposed to graduate training and research, I do not think this disparity is likely to diminish much in the near future...." Martin Trow[7]

> "... undergraduate education in a large university is more likely to be acceptable than outstanding; educational policy from an undergradaute point of view is largely neglected.... How to escape the cruel paradox that a superior faculty results in an inferior concern for undergraduate teaching is one of our more pressing problems." Clark Kerr[8]

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5. *See for example University of California, Berkeley, Academic Senate, Education at Berkeley: Report of the Select Committee on Education, University of California Press, Berkeley, 1968; Talcott Parsons and Gerald Platt, The American University, Harvard University Press, Cambridge, 1973; Christopher Jencks and David Riesman, The Academic Revolution, New York: Doubleday, 1968.*

6. *Christopher Jencks and David Riesman, op.cit. p 500.*

7. *Martin Trow, op.cit. pp 13 and 14. See also Trow's critique of the Muscatine Report (Education at Berkeley, op.cit.) and why it had minimal impact.*

8. *Clark Kerr, The Uses of the University, With a "Postscript - 1972", Harvard University Press, Cambridge, 1963, 1972, p 65.*

Another tack in understanding the possibilities of a large university, the one followed in this report, is detailed case studies of those programs, like CNR, that have resolved, to a much greater degree than the norm, a number of dilemmas in higher education; and which offer a superior undergraduate education effectively tapping the university's vast resources. They can be instructive on several fronts: One, they reveal what can be accomplished in a large university with all of its inherent limitations and advantages. Two, an understanding of how they were developed and are maintained can emerge. Three, strategies could be devised to extend their insights to other programs. Four, the ways and means of assuring their continuation with quality would be apparent. The tragic paradox is that these programs also tend to come under attack and be eliminated or modified until the characteristics that made for their success are virtually lost, for reasons largely unrelated to their cost.

We will briefly examine the frequently noted weaknesses in undergraduate education, especially in large universities, that CNR has, to a great extent, overcome.

1. Global perspective. We are at a critical juncture in human history. Humankind is required, for the first time, to solve concrete problems at a global level. Our common problems are integrally interrelated and worldwide in scope - arms control, energy, food and hunger, natural resources, population, and pollution, to name but a few of the more prominent.[9]

Higher education is confronted with an unprecedented challenge: is it to remain in much the same position as Hegel characterized philosophy to be in - as being useful in comprehending forces and events only after they have nearly played themselves out, "the owl of Minerva begins its flight at dusk"?[10] Or worse, will it contribute to worsening the conditions? Or can it rise to the challenge of being "an owl before dusk" as suggested in the evocative essay by Michio Nagai, Minister of Education, Science, and Culture in Japan?[11]

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9. *See, for example, The Club of Rome Report; Meadows, Meadows, Randers, and Behrens, Limits to Growth, New York: Signet, 1972; U.S. Council on Environmental Quality and the Department of State; Global 2,000 Report to the President, Washington: U.S. Government Printing Office, 1980; Paul and Ann Ehrlich, Extinction: The Causes and Consequences of the Disappearing Species, New York: Random House, 1981.*

10. *George Hegel, "Philosophy of Right and Law," 1820, in The Philosophy of Hegel, Carl Friedrich, ed., New York: Modern Library, 1953.*

11. *Michio Nagai, An Owl Before Dusk, with a forward by Clark Kerr, and an introduction by David Riesman, The Carnegie Commission on Higher Education, Berkeley, 1975.*

Higher education could play a critical role in the resolutions of impending world crises; indeed it must if there is to be a chance for humane solutions in solidarity with all of humankind. Yet, higher education remains provincial and fragmented. Rarely are students enabled to develop systematic global world views. College students in America are, by and large, painfully ignorant of the world in which they live.[12] All too often when it is a subject of study, "internationalism" is taken to be synonomous with "Americanization."[13,14]

The CNR program, in sharp contrast to the norm, has developed an increasingly strong pluralistic and interdisciplinary global perspective. Students are examining local problems in their global context, as well as focusing internationally on many major global problems - energy, food and agriculture, natural resources, etc.. Environmental issues are, thus, studied in their worldwide setting from philosophical, historical, social, economic, and political perspectives along with their scientific aspects. For instance, students, as part of their course of study in CNR, have in the past year been studying, undertaking projects, and doing internships in many other nations, particularly undeveloped countries, on virtually every continent: from China to Columbia, and from Australia to Zambia. CNR graduates can, similarly, be found studying or working on global environmental problems at home and abroad. Documentation and further discussion can be found throughout this report, especially Part II, Section 1 - Interdisciplinary Study, and Part VIII - The Advanced Educations, Careers, and Lives of CNR Graduates. The interdisciplinary and flexible features of CNR have been instrumental in allowing students to study emerging global problems from a holistic perspective. Thus, CNR has been able to respond emphatically to the increasing need for higher education to reflect a global stance, and to take global problems seriously.

2. The balance between a "liberal" education and career preparation. Though educational thinkers universally assert the importance of a humanistic and liberal arts aspect to undergraduate education, there is little agreement about how to accomplish it,

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12. *Educational Testing Service; What College Students Know About the World, Council on Learning, New York, 1980.*

13. *Michio Nagai, op.cit., p 40.*

14. *For further background on this issue, see this report pages 30-32; Michio Nagai, op.cit.; George Bonham, "Education and the World View," Change - The Magazine of Learning, Vol 12, No 4, May/June 1980, pp 2-7; Burns H. Weston, "Contending with a Planet in Peril and Change: An Optimal Educational Response," Alternatives: A Journal of World Policy, Vol 5, No 1, June 1979.*

and much concern over its continued decline.[15] The other side of the coin is that graduates from the "academic disciplines," especially the liberal arts, are thrown into a single undifferentiated labor pool of college graduates and are unable to find positions that draw significantly on the knowledge and skills they gained in college (42 percent of all college graduates with Bachelor's degrees fell into thei category in 1977).[16,17]

One of the most pressing horns of this dilemma is the acceleration of the production of increasingly mechanistic, single-dimensioned persons especially in the scientific and technical fields.[18] Thus, of particualr relevance to CNR, is the importance of infusing training in science and technology with human traditions and values. The issue is sharply drawn by Sheldon Wolin, a leading scholar in the area, and editor of Democracy:

> "The problem is that by its own self-understanding, science is inherently incapable of serving society as other great political and religious world views have in the past. Science is a source neither of moral renewal nor of political vision; it has no principle that requires solicitude for traditions or historical identities that, until recently, were the basis for most political thinking and action. There is still time to deal with this problem before the memory of democracy and education is obliterated, but it requires a clearer picture of the stakes and their form.
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> "... The specific nature of technical education is that it is what it claims to be, immediately useful. The technician, in other words, is a unit of potential power, ready to be fitted into the predesigned slot for which his or her education has been a preparation. It is at this point that the demise of liberal and humanistic education becomes crucial. As

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15. *For a broad outline and analysis of this situation, see, for example "Perspectives on Liberal Education," Roger L. Geiger, "The College Curriculum and the Marketplace," and Mark B. Ryan, "Doldrums in the Ivies: A Proposal for Restoring Self-Knowledge to a Liberal Education," in Change - The Magazine of Higher Education, Vol 12, No 8, November/December, 1980; and Michio Nagai, op.cit..*

16. *National Center for Educational Statistics, Digest of Educational Statistics, 1978.*

17. *For further discussion and citations on this point, see pages 35-38 of this report.*

18. *The larger implications of this trend are discussed in: Herbert Marcuse, One-Dimensional Man, Boston:Beacon Press, 1964; and Christopher Lasch, The Culture of Narcissism: American Life in the Age of Diminishing Returns, New York:W.W.Norton, 1978.*

> more and more educational time is taken up with technical subjects to the exclusion of humanistic ones, the individual becomes a more 'perfect' unit of power, unalloyed by useless, reflective, critical notions of the kind deposited by the humanities, and hence easily integrated into the system as a whole person, that is, a person who is the sum of his/her technical parts.
>
> ...
>
> "In retrospect, one can see that the value of humanistic education was surplus value.... It did not make sense in an input-output model of a knowledge-power relationship; but it spoke instead to how a person should live by himself and with others. And because it spoke to persons rather than things, it formed a critical presence of unincorporable power in a world where, increasingly, the line between treating persons and handling things was becoming obliterated. The problem does not require a simple restoration of a humanities curriculum, but facing up to the fact that if current tendencies in higher education go unchallenged, then higher education will continue to be an essential cornerstone of the anti-democratic structure of our society."[19]

CNR's resolution of this dilemma has several important aspects. First, it breaks down the arbitrary boundaries between career preparation and "liberal" or humanizing studies that is prevalent. That is, it attempts to infuse scientific knowledge with appropriate philosophical and ethical concerns simultaneously. CNR requires a minimal number of specific courses, while requiring students to select a set number of courses in each of several broad areas of knowledge - humanities, social sciences, physical sciences, biological sciences, and mathematics/statistics - from the near infinite number of offerings available on the Berkeley campus. Therefore, students can gain breadth while at the same time selecting courses that allow them to develop a holistic, interdisciplinary systems perspective in their particular Area of Interest. For example, CNR students ranked third, among the 40 U.C. programs surveyed, on the importance they placed on gaining a broad liberal and humanistic education, and ranked second on the degree to which they judged their program had met their expectations in this area (see pages 14-18). CNR students ranked their program first in availability of course options to meet their specialized interests (see page 39).

Secondly, CNR has addressed the call for a humanizing liberal education by incorporating the values and practices that a "liberal"

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19. *Sheldon S. Wolin, "Higher Education and the Politics of Knowledge," Democracy: A Journal of Political Renewal and Radical Change, Vol 1, No 2, April, 1981, pp 38-52.*

education is purported to yield in the structures and processes of the program itself - that is, creating a setting where students are encouraged and supported in assuming meaningful social responsibility in their many communities as an integral part of their program. For the development and documentation of the effects of this, see Part III - Advising, Part IV - Community and Democracy in CNR, and Part V - CNR Students' Contributions to Community.

These same factors also facilitate career preparation. The flexibility and practical experience features of the CNR program, in conjunction with sustained dialogue with others, especially, their faculty advisors, enabled students to progressively evolve a specific Area of Interest, undertake the essential academic course work, and gain the appropriate practical experience, to be prepared for the jobs and careers of their choice. Thus, 96 percent of CNR's graduates are actively engaged in the identification, understanding, or solution, or all three, of environmental problems in either their paid, or un-paid, work, or in their advanced degree programs. Only 75 percent of U.C. graduates in general acquired knowledge or skills, as undergraduates, that was of value in their current work or studies (see Part VIII -The Advanced Educations, Careers, and Lives of CNR Graduates). The overwhelming majority of CNR graduates (approximately 98 percent) have entered careers, or are studying in advanced degree programs to undertake professions, which concretely contribute to improving the human condition. They evidence a strong degree of social responsibility and humanitarian concern in their later lives. In contrast, anywhere from 50 to 80 percent of the positions or jobs available in our society can be considered as socially unproductive, depending on which data and analysis your use (see Part VIII of this report).

Therefore, we can conclude that CNR graduates have obtained both a fine and humanizing liberal background, and specific career preparation. Even more importantly, they have enacted these values in their lives, and have obtained jobs, careers, or are continuing to study in the areas for which they prepared themselves as undergraduates in CNR, to a much greater degree than U.C. graduates in general have.

3. The relationship between academic study and experience. Great philosophers from Socrates to John Dewey have emphasized that profound thought and accomplishment come out of the intellectual struggle in real life.[20] Increasing attention is being given to the place of practical experience in higher education. In an all too typical manner, a new label has been coined, "experiential

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20. John Dewey, Experience and Education, New York: Collier, 1963 (originally published in 1938).

education," for an educational phenomenon as old as the species.[21] The difficulty with much of the "practical experience" incorporated into programs in higher education is that it has become formalized and ritualistic, rather than a confrontation with substance and issues in the world.[22] It is just this struggle with ideas, issues, and scientific problems in the crucibles of their origin that contains the greatest potential power and stimulation in utilizing practical experience as a rich aspect of an educational program.

CNR has excelled in this area. Students are encouraged to seek, on their own initiative, with facilitating resources and support, practical experience in diverse dynamic settings. CNR students use field studies, internships, and other sources of practical experience to a greater extent than students in any other undergraduate program at Berkeley, as integral components of their individually tailored programs. Students, and graduates, judge practical experience to have been an incredibly valuable part of their education in CNR (see Part III, Section C - Independent Studies and Internships, pp 68-79). The extensive and important contributions that CNR students have made to their many communities through "practical experience" options are described and documented in Part V - CNR Students' Contribution to the Community. This documentation illustrates that the experiences CNR students tend to engage in are not empty exercise, but rather significant involvements that frequently yield substantial contributions to the public welfare. The intellectual as well as practical challenges encountered are critical and sustaining.

The results of these experiences are multi-dimensional in their impact on students. A list of those most frequently documented in this study follows: 1)an increased motivation and application to gaining knowledge and understanding in academic studies; 2)increased understanding of, and commitment to, democratic values and processes; 3)a clarification and decision on a specific Area of Interest; 4)a choice of career specialization and determination of an appropriate course of study in preparation for a career; 5) obtaining career positions as a result of field studies or internships; 6)gaining acceptance to the graduate or professional school of their choice; 7)a better understanding of their abilities, skills, and

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21. *For current developments and thinking in the area of education and experience, see Arthur W. Chickering, Experience and Learning An Introduction to Experiential Learning, New Rochelle, N.Y.: Change Magazine Press, 1977; and Morris T. Keeton, et.al., Experiential Learning: Rationale, Characteristics, and Assessment, San Francisco: Jossey-Bass, 1976.*

22. *For example, and to illustrate that this problem is not recent, see Stephen Leacock, "The New Education," in Louis Locke et.al. eds., Toward Liberal Education, New York: Rhinehart, 1949.*

interests; and 8)a vital synthesis of academic knowledge and real world conditions essential to the identification, understanding, and solution of environmental problems.

The imaginative and focused integration of "practical experience" into their educational programs by CNR students has produced documented results of inestimable educational value to themselves, and to society, when judged against the aims and purposes of the University, and the CNR program.

4. Alienation, apathy, and excessive selfish-individualism in higher education. The literature abounds with descriptions, documentation, and analyses of these associated phenomena, both in society at large and among students.[23] The highly competitive nature of higher education, especially at "top-ranked" schools like Berkeley, the absense of any sustaining community in most programs in the University, and the lack of close and sustained association with faculty are among the factors contributing to these conditions in large universities.

The remoteness of faculty from undergraduates, and the consequent unavailibility of productive and continuing relationships between students and faculty, is a problem that has concerned large universities for decades, and one which still persists (for Berkeley data, see pages 56-60). For example:

> "... The various efforts at Berkeley to 'bring faculty and students more closely together' outside the curriculum fail both because the association thus engendered is superficial, and because it divorces the man's personal qualities from his demonstration of them in his scholarly life."[24]

The usual approach to these conditions is to blame the victim, and within the university setting, to recommend psychological counseling, or to assume it is the inevitable consequence of the nature of the institution, about which nothing can be done.[25]

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23. *See Christopher Lasch, The Culture of Narcissism, op.cit.; in education, see "Knowledge, Education, and Human Values," Teachers College Record, Vol 82, No 3, Spring, 1981, especially Robert N. Bellah, "Cultural Vision and the Human Future," pp 497-506, and Hubert L. Dreyfus, "Knowledge and Human Values: A Geneology of Nihilism," pp 508-520; Michio Nagai, An Owl Before Dusk, op.cit. for comparative data from students in several countries; and Mark B. Ryan, "Doldrums in the Ivies," op.cit..*

24. *Martin Trow, op.cit., p 11.*

25. *William Ryan, Blaming the Victim, New York:Random House, 1972,1976.*

CNR has chosen niether of these courses. The prevalent phenomena have not been a significant problem in CNR because of the purpose of the program, and the nature of its structure and processes. The CNR program was not designed to specifically eliminate these problems, but rather to develop the most effective educational program that faculty, students, and staff working together were capable of crafting.

CNR has successfully avoided creating the conditions that precipitate these phenomena in universities, and done a great deal to overcome the effects of the University, and society at large, on its students in these areas. The development and maintenance of a vital democratic community in CNR plays the central role in this achievement (see Part IV - Community and Democracy in CNR). The overwhelming majority of CNR students and graduates are satisfied with their education in CNR; while U.C. students and graduates, in general, are substantially less satisfied (see pages 9-11). CNR students highly value CNR's democratic community and participate extensively in it (see Part IV).

CNR students tend to form close and productive associations with one or more faculty members, and often work in collaboration with several faculty members on CNR community concerns. The anchor pin of CNR's extensive advising system is a sustained relationship with one faculty member. These relationships are frequently of outstanding quality in terms of their contributions to students' educations and lives. CNR's advising system ranked first among the 40 programs surveyed in the data reported in this study. Part III - Advising in this report documents and discusses the points made above (additional data can be found in Part II - Curriculum and Teaching, pages 56-59). Thus, as a result of CNR's community, advising system, and courses, students have generally formed close and valuable relationsips with faculty, in marked contrast to the vast majority of undergraduates on the Berkeley campus.

The atmosphere in the CNR community, and in the majority of its courses, is cooperative, rather than competitive. A great deal of cooperative learning, sharing, and working together occurs as a natural part of the whole CNR program. (For description, documentation, and discussion, see Part II - Curriculum and Teaching, Section 3 - Courses and Teaching; Part IV - Community and Democracy in CNR; and Part V - CNR Students' Contributions to the Community.) The impact of the democratic and cooperative atmosphere on the educations and lives of students, beyond avoiding alienation, apathy, and excessive selfish-individualism is extensive, and detailed in the sections of this report noted above.

A large portion of CNR's students and graduates are actively exercising their responsibilities as citizens in their many communities, including within the CNR community. Rather than being apathetic, they are engaged in socially responsible ways seeking to contribute to the public welfare. CNR students have

made more extensive contributions to the University community, and their communities beyond the University, than students in any other undergraduate program at Berkeley (see Part V - CNR Students' Contributions to the Community). These contributions are typically made as the result of collective efforts, often in collaboration with groups in the community. As a result of their experiences in CNR, students and graduates have developed a better understanding of democracy, and a stronger commitment to democratic values and practices. (see Part IV - Community and Democracy in CNR)

Thus, one of the most compelling findings of this study is the extent to which CNR students and graduates are, with intentional awareness, committed to: the pursuit of knowledge; application of that knowledge to solving environmental and other problems in the public interest; and, democratic values and practices. These stand in marked contrast to the norm and the conditions of alienation, apathy, and selfish-individualism that are so typical among college students.

5. Equity for women in higher education. In spite of the women's movement, affirmative action, and increased consciousness in society, women are still far from achieving equity in higher education. Less than 25 percent of the faculty members in all institutions of higher education in the United States are women, and the percentage is even smaller in major universities like Berkeley. (10.6 percent of the ladder rank faculty at Berkeley are women, with the majority concentrated in the lower ranks.) Women faculty still earn less than men with the same academic rank, and advance up the ranks more slowly. Women are awarded less than 25 percent of the PhD's, MD's and Law degrees granted each year in the United States. (33 percent of the graduate students enrolled at Berkeley in the fall of 1981 were women.)[26]

By way of illustration: In virtually every field at Berkeley, there is a higher percentage of women in the undergraduate program than in the graduate program in the same field; there is a higher percentage of women who begin graduate studies than the percentage of women who eventually earn their doctorates in the same program; and a higher percentage of women earn doctorates than the percentage of women on the faculty of the program in which they earned their doctorate.[27]

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26. *These data are from the Women's Equity Aciton League's Education and Legal Defense Fund Report, July 1977, as reported in Women's Studies Newsletter, National Women's Studies Association, Winter and Spring 1978.*

27. *University of California, Berkeley, Women Students at Berkeley: Views and Data on Possible Sex Discrimination in Academic Programs, June 1977.*

Clearly inequity exists at all levels in higher education. The typical explanation is that many of the factors contributing to this condition are found in the women themselves, and not amenable to change. They are said to derive from earlier experiences in education and society; and some maintain that they are biological. Either way, the implication is the same - the institution can not do much to alter the inequity. The sources of this inequity are indeed many and complex, but they can be overcome, even in a large university like Berkeley. The Conservation of Natural Resources Major is one example of what can be accomplished.[28]

Women in CNR have achieved equity. In spite of the situation campuswide, CNR women, on every available index, have equalled or surpassed CNR men. Though the natural resource fields have been traditionally male dominated and remain that way, the sex ratio in CNR favors women. (CNR undergraduates - 58% women; undergraduates campuswide - 43% women [December 1980]) Three of the four faculty members permanently assigned to CNR are women. Women students in CNR assume leadership positions in CNR and across campus more frequently than men students in CNR. Women students and graduates are as satisfied with their education in CNR as men. CNR women go on to advanced degree programs more frequently than CNR men, and in recent years, more frequently than U.C. undergraduate women in general. CNR women enter graduate and professional schools in traditionally male fields, and appear to have the same retention rates as men. Older women returning to college, who generally have a more difficult time than younger women in the usual undergraduate age range, are especially satisfied with their education in CNR. CNR women entering the work force with a Bachelor's degree, in sharp contrast to U.C. women in general, find positions that draw on their CNR education as frequently as CNR men do, and usually in male dominated fields. CNR women, again in sharp contrast to U.C. women in general, are nearly as satisfied in their careers, or developing careers, as are CNR men. And CNR women who are in or have completed advanced degrees are more satisfied than are CNR men. CNR women and CNR men are significantly more satisfied with their careers or developing careers than are either U.C. men or U.C. women in general.[29]

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28. *The following sources develop the data, problems, and issues involved in women's equity in higher education: "Women in Education," Harvard Educational Review, Part I, Vol 49, No 4, November 1979 (entire issue), Part II, Vol 50, No 1, February 1980 (entire issue); and Editors, Change Magazine, Women on Campus: The Unfinished Liberation, Change Magazine Press, New Rochelle, N.Y., 1975.*

29. *The extensive data that yield these conclusions along with discussion and analysis can be found in the following parts of this report: Part VI - Women and Men in CNR; Part VIII - Advanced Educations, Careers, and Lives of CNR Graduates, especially, "Women vs men entering advanced degree programs" (pp 224-229), and "Satisfaction: women vs men" (pp 241-242).*

The CNR program unequicovally demonstrates that it is possible to create an undergradaute program at Berkeley with relatively equal percentages of women and men in traditionally male dominated fields, where women achieve equity. The effects of this equity persist dramatically after graduation. Furthermore, this is achieved in a setting where both men and women are equally satisfied with the quality of education they received, both as students, and later from their perspectives as graduates. The significance of this accomplishment, given the general status of women on campus, should not be underestimated.

CNR has not made any special efforts to achieve equity for women beyond those made on behalf of all students in the program. All of the data and analysis presented throughout this study point to the following condition as the principal source that has enabled women to achieve equity through the CNR program: This outstanding accomplishment flows from the democratic humanism that pervades CNR where the intent and desire is to treat everyone with respect, dignity, and equality of worth. Thus, a cooperative community where all - faculty, students, and staff - strive to work together as equals in all aspects of their common pursuit of a quality education, enables women (and men) to achieve authentic equity.

The Recovery of Wholeness

This last, and perhaps ultimate, dilemma confronting higher education encompasses all of the rest. It is not just applicable to higher education, but possesses a critical challenge to all education in its broadest definition. It raises the fundamental question of our time:

"Is there hope for humankind?"

A seminal presentation of this question that has come to haunt the interstices of all our concerns is Robert Heilbroner's work in An Inquiry into the Human Prospect.[30] His conclusions, after considering the evidence, are sobering:

> "... If then by the question 'Is there hope for man?' we ask whether it is possible to meet the challenges of the future without the payment of a fearful price, the answer must be: No, there is no such hope.

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30. Robert L Heilbroner, An Inquiry into the Human Prospect, New York: W.W. Norton, 1974.

> "...the danger that can be glimpsed in our deep consciousness when we take stock of things as they are now: the wish that the drama run its full tragic course, bringing man, like a Greek hero, to the fearful end that he has, however unwittingly, arranged for himself....
>
> "The question, then, is how we are to summon up the will to survive - not perhaps in the distant future, where survival will call on those deep sources of imagined human unity, but in the present and near-term future....
>
> "... If, withing us, the spirit of Atlas falters, there perishes the determination to preserve humanity at all cost and any cost, forever."[31]

Heilbroner correctly maintains, in our opinion, that the intellectual elements of the world bear a heavy responsibility in meeting this challenge within themselves, and in the education of others. The inescapable conclusion that the quality of life around us is deteriorating on many fronts must be faced, and systemic corrective action of great magnitude and vision instituted if we are to survive. Higher education has a profound responsibility to discharge.

This was the quiet, but persistent, theme that ran through an important gathering of leading intellectuals, educators, business people, and government officials in June 1980 to consider: Knowledge, Education, and Human Values: Toward a Recovery of Wholeness.[32] The purpose was, in one sense, to seek solutions to the human dilemmas posed by the Club of Rome's report, The Limits of Growth, and the Global 2,000 Report. That is, to cast the dilemma in its human context, realizing that the answers do not, indeed can not, rest in a technological solution alone. They sought to explore "the relationship between education in its broadest sense and those dimensions of experience that give value, meaning, and purpose to human life." And concluded, in part, that "a radical change of premises and a total transformation in our ways of knowing may give to education an unexpected and profound social dimension" They necessarily went beyond the more limited question: "What is the proper balance between the 'liberal arts' and vocational or scientific training or both?"

A central contradiction is succinctly phrased by Hubert Dreyfus, a professor of philosophy at Berkeley:

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31. *Robert L Heilbroner, op.cit., pp 136, 142, 143, and 144.*

32. *The Kettering Foundation in cooperation with Teachers College, Columbia University, "Knowledge, Education, and Human Values: Toward a Recovery of Wholeness," Teachers College Record, Vol 82, No 3, Spring 1981.*

> "... If we accept the view of reality implicit in theory and science then we will get objectification, we will get a reality independent of our interests and concerns, independent of our everyday context, and therefore intrinsically and necessarily meaningless.... It is admirable to be able to make a part of reality meaningless and thereby get so much theoretical understanding and power from it. It is our fault if we decide this meaningless realm is ultimate reality, and let it make our lives meaningless as well."[33]

The dooms day atmosphere, not unrealistically, pervades the conscious and pre-conceptual world views of humanity today, especially the young who have more to loose. It certainly contributes substantially to the alienation, apathy, and narcissism growing in our midst as one response to a pre-conceptual, and at times conscious, sense of hopelessness. How can higher education respond to these conditions?

The CNR experience suggests some fruitful possibilities. It is in this general world condition that so many CNR students have overcome, at some levels, their apathy, alienation, and selfish individualism. It was Kierkegaard who in the 19th century forcefully raised the need for something "new" and focused on the "defining relationship" - an unconditional commitment to someone or some course as providing meaning, significance, and purpose in life. Many philosophers who followed in the tradition of Kierkegaard have spoken to this need. Its relational character is well developed by Martin Buber[34] in his contrast between the "I-Thou" and the "I-It" relationships.

The features in CNR which contribute to a "recovery of wholeness" are described below:

We have already spoken at length about the problem-centered focus of CNR - the solution of environmental problems in the public interest. This has led CNR students, both formally and informally, to construct a systematic environmental philosophy and ethic as part of their education, which invariably leads to and encompasses a more complete ethical system. They recognize that this is an essential prerequisite to resolving problems in ways that enhance the common wielfare. It requires one to have, at least temporal, positions on what the common welfare is. The second interactive aspect is CNR's democratic humanism. The problems and ehtical questions are considered in a democratic community where relationships and collectivity are dominant.

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33. *Hubert L. Dreyfus, "Knowledge and Human Values: A Geneology of Nihilism," in Teachers College Record, Vol 82, No 3, Spring 1981, pp 508-520, and p 518.*

34. *Martin Buber, I and Thou, translated by Ronald G. Smith, New York: Scribner, 1958.*

This places the knowledge being acquired in a community context - a mileau that helps infuse it with a critical social dimension. The dialogue of the community takes the raw knowledge, whatever its sources, and chews it owver in search of its appropriate social meaning and significance.

Education in CNR is more "complete" than in traditional programs. It actively encourages students to engage in and learn from as many diverse situations as possible, not just in a standard classroom setting. Education itself is a key topic in CNR students' educations, both in crafting their own education, and in fully participating in the discussion and larger decisions of the CNR program. Students are involved in their communities and acquire a rich array of provocative experiences there. Thus, a much wider range of students' abilities and talents are developed and brought into play in achieving the underlying aims and purposes of a university education. Environmental problems are grasped, not simply in academic terms, but in their fullest manifestation in the world. This precipitation of the whole person into their education, as a conscious and intentional being, with guidance and critical support is one vital key to CNR's success.[35]

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35. *This report thoroughly documents this conclusion, which provides the basis for understanding what for some may pose a contradiction. If CNR is so outstanding, why is the average Grade Point Average (GPA) of CNR students the same as the campuswide average? (see Part II, Section 4 - CNR Students' Grades) The resolution of this contradiction resides in the fact that traditional academic criteria (GPA's, SAT's, GRE's, MCAT's, etc.) do not bear any relationship to any of the ultimate criteria against which a reasonable person would assess whether or not the University had achieved its fundamental aims and purposes. That is, these traditional criteria do not predict: 1) the quality and productivity of scholars (including scientists); 2) success in the profession for which persons are being trained by any criteria, including those chosen by the professions themselves; 3) contributions to society (public service, social responsibility, etc.); 4) satisfaction in career or life; or 5) any other criteria beyond later grades. (See D.P. Hoyt, The Relationship Between College Grades and Adult Achievement: A Review of the Literature, Research Report No 7, Iowa City, Iowa: American College Testing Program, 1965; David McClelland, "Testing for Competence Rather than for Intellegence," American Psychologist, Vol 28, No 1, January 1973, pp 1-14) Whatever internal value these indices may have, it is irrefutable that they bear no substantial relationship to criteria of import outside of the institution. Regardless of the reasons that underlie this finding, the finding has been replicated hundreds of times in a myriad of settings and conditions. The success of CNR in terms of a number of criteria derived from the aims and purposes of the University can be attributed to the fact that it does activate a number of abilities, skills, and attitudes that are related to achieving these goals in later careers and lives. Thus, the fact that CNR students' average GPA is the same as the campuswide average does not pose a contradiction.*

CNR students as a group have made significant inroads in overcoming one of the most debilitating outcomes of America's traditional educational model - the endemic contradiction between intellect and emotions, and between thought and action. These contradictions are often expressed in the difference between the stated values and goals of this country's institutions, and what in fact they demonstrate and accomplish in practice. This largely pre-conceptual, or non-conscious, hypocrisy has reached a highly refined state in higher education; it is a formidable obstacle to progress. For instance, the democratic humanism professed by colleges and universities in this country stands in contradiction to the actual structures and, even more significantly, the practices that pervade higher education.

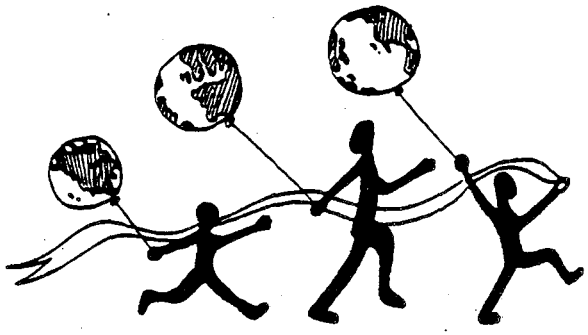
The stress on critical analysis and reflection as a synthesizing mode for persons' "complete' experience in CNR, including academic coursework, encourages students to develop philosophical and ethical systems and to critique their thought and actions against these evolving systems, fully engages students in the on-going effort to improve the CNR program and to maintain an internal consistency with its stated values and goals, and facilitates the blending of academic knowledge with authentic efforts (focused experience) to solve environmental problems in society. This sustained dialogue among those in the CNR community, centered on "whole" persons passionately involved in their own and humankind's existence, has enabled students to achieve considerable integration and integrity in their beings - where intellect and emotions, thought and action, seek a unity. This process is an essential component of establishing a harmony within, a unity with humankind, and an interdependent relationship with nature - a blueprint for survival.

In keeping with the democratic structure and processes in CNR, students typically work collectively in their many communities. That is, they tend to form groups around a common concern, and then frequently establish coalitions or cooperative relationships with other groups, particularly community groups, who share a similar concern. This engagement with the community as partners and equals is not the typical pattern fostered by the University. Faculty and administrators, and students who have followed them in the elite traditions of the universities, have tended to relate to the public through the centers of power in the state and nation. CNR students and faculty have tended, much more frequently than the norm, to anchor their concern with the public, and to relate to all levels of society, including the centers of power, from that position. It is in this manner that they continually discharge one of the fundamental purposes of a state land grant university - service to the people of California, the nation, and the world. Though this is a unique way to fulfill this basic responsibility, it has been demonstrably effective. The significance of this departure from the norm may be far more important in the search for "wholeness" than is immediately apparent.

Czeslaw Milosz, an emeritus professor at Berkeley, in the 1980 Nobel Lecture probes for the heart of this elusive relationship to the polity:

> "... A profound transformation of which we are hardly aware, because we are part of it, has been taking place, coming to the surface from time to time in phenomena that provoke general astonishment. That transformation has to do, and I use the words of Oscar Milosz (an important Lithuanian-Parisian poet of the early 20th century who was prophetic), with "the deepest secret of the toiling masses, more than ever alive, vibrant and tormented." Their secret, an unavowed need of true values, finds no language to express itself, and here not only the mass media, but also intellectuals, bear a heavy responsibility."[36]

The consequences. Reviewing the full sweep of this report, we sense something relatively unique in CNR students and graduates: they express a hope for the future. Not a naive hope, but a hope fashioned out of a prolonged struggle with the crises confronting humankind, and the experience of relationship, support, and strength from working together to resolve these crises in a cooperative community. A large portion of CNR students graduate feeling "empowered," with knowledge and the ability to apply it collectively with others to solve real and concrete problems. The high levels of motivation, commitment, and determination can readily be seen in the pursuits of people while in CNR and after they graduate. This is especially evident in their passionate commitment to democratic values and practices, and in the shouldering of substantial social responsibility for the common welfare. The Conservation of Natural Resources Major is far from a perfect program, but an uncommonly large percentage of its students leave with a deep and evolving sense of the value, meaning, and purpose of human life - a rare, yet essential, accomplishment in these times if there is to be a future. That is the "holistic" quality available in the CNR program.



36. Czeslaw Milosz, "The Nobel Lecture, 1980" The New York Review of Books, March 5, 1981, p 15.

Appendix A.

Technical Data and Sources of CNR Material

1. Surveys and Questionaires

A. CNR Questionaires

1. Student-Initiated Questionaire 1976. This questionaire was designed and administered by students in a CNR-198 Independent Group Study with a faculty advisor, and supported by an ASUC-Mini Grant. It was concerned with the current and future directions of the CNR major. In its report, Synthesis of Student-Initated Questionaire (38 pages), a number of recommendations were made, many of which were instituted. (261 students responded to this questionaire, or 65% of CNR's enrollment.)

2. The 1980-1981 Student Questionaire. This questionaire, developed through the collaboration of faculty, students, and staff, was designed to assess the impact of CNR on students in terms of the six central elements of the CNR program (see pages 2-3). In this manner it parallels the Follow-Up Study of graduates. (105 students completed the questionaire, or approximately 36% of the persons enrolled in CNR during the period the questionaire was collected.)

3. The CNR Follow-Up Questionaire (1980). This extensive narrative and quantitative questionaire, developed through the colloboration of faculty, students, staff, and alumni, sought to assess graduates' evealuation of their CNR education from their current position in life; both its value at the time they were in the program and the impact of CNR on their life since graduation. (217 persons completed questionaires were received, approximately 27% of all CNR graduates (1971-1979), and 36% of the CNR graduates for whom we had valid addresses.)

B. Surveys that included CNR and other Undergraduate Programs

1. Social Science-Related Programs - An Academic Review Using Comparative Student Evaluation, November 1979, Academic Review Unit (ARU) of the Associated Students of the University of California (ASUC); compiled by Jeff Koon. Programs surveyed: Anthropology, Business Administration, Conservation of Natural Resources, Development Studies, Economics, Geography, Linguistics, Political Economy of Industrial Societies, Political Economy of Natural Resources, Political Science, Psychology, Social Science Field Major, Social Welfare, and Sociology.

C. Surveys used for Comparative Purposes that did not include CNR

1. Life Science-Related Departments and Programs at Berkeley, ARU-ASUC. 1978, compiled by Jeff Koon. Programs surveyed: Bacteriology, Biochemistry, Biology Plan A, Biology Plan B,C,D, Biology of Natural Resources, Bio-Medical Physics, Botany, Chemistry (in the college of chemistry), Chemistry (in L&S), Nutritional Sciences, Genetics, Health Arts and Sciences, Physiology, Psychology, Public Health, Zoology, Physical Sciences.

2. Selected Humanities Departments at Berkeley, ARU-ASUC, 1978, compiled by Jeff Koon. Programs surveyed: Music, Art, Art History, Miscellaneous Humanities, French, German, and Spanish.

3. Survey of Graduates, University of California, Berkeley, Office of Students Affairs Research, Spring 1978. This survey was of the graduates of the classes of: 1971 (N=919); 1974 (N=610); and 1977 (N=669) for a total sample of 2198. We are grateful for the access to the print-outs from this survey prior to final analysis and publication. This is the only extensive follow-up survey of U.C. graduates available.

D. Comparability of Surveys and Questionaires

The 71 questions on the ARU-ASUC surveys were directly comparable across all three surveys, with some exceptions on the Social Science-Related Programs survey. A sample of ten questions from the ARU-ASUC surveys was included on the CNR Follow-Up Study to facilitate comparisons. The inclusion of CNR in the ARU-ASUC surveys makes the CNR sample directly comparable to the other 39 undergraduate programs surveyed. Some of the questions of the CNR Follow-Up Study were directly comparable with those on the Survey of Graduates, U.C.; other comparisons were made through extrapolation. Many of the questions on the 1980-1981 Student Questionaire were directly comparable with the questions on the CNR Follow-Up Study. The specific questions are included throughout the study to facilitate interpretation and comparison.

E. Representativeness of Samples

The ARU-ASUC surveys and the U.C. Graduate surveys used standard sampling methods; and in all instances meet acceptability criteria.

The strategy in the CNR questionaires was to get as complete returns as possible from the entire population being considered. In each instance the numbers responding were a large percentage of each group (see descriptions above). In each case the questionaire was distributed to the entire population - for the 1976 questionaire, during study list filing; for the 1980-1981 questionaire, there was a mailing to the entire CNR student body, and for the CNR Follow-Up Study, the questionaire was mailed to all CNR graduates with known

addresses. In each instance systematic follow-up efforts were made, within our limited resources, to get as large a sample as possible.

It is our informed conclusion that each of the two major CNR studies used in this report (The 1980-1981 Student Questionaire, and The CNR Follow-Up Study) are essentially representative. This judgment is based on the following reasons: 1)the large size of the samples; 2)we checked a random sample of students and graduates who had not completed the questionaires, and were unable to detect significant differences between the two groups; 3)we included 10 questions in The CNR Follow-Up Study that were also on the ARU-ASUC surveys. Though the obtained means from these questions varied widely among the several programs surveyed, there were no significant differences between the obtained means of responses from CNR students in the ARU-ASUC surveys and The CNR Follow-Up Study; 4)in those instances where it was possible to compare questions on the ARU-ASUC surveys with questions on the CNR surveys (1980-1981 Questionaire and the Follow-Up Study), we again found no significant differences between the three groups of CNR people. Thus, we found consistent results from the three distinct data samples of CNR students and alumni. The above examples are noted and discussed at appropriate points throughout this report; and 5)we have fairly accurate data on the advanced education and/or careers of over 400 CNR graduates. The percentages in each of the categories developed within these data did not significantly differ from that for the sample of 217 graduates who responded to the CNR Follow-Up Questionaire.

The most parsimonious inference from these data is that each of the CNR samples are reasonably representative. The alternative hypothesis that each of the CNR samples had an identical bias would be difficult to sustain.

F.Confidence Intervals and Statistical Significance

The analyses used in this report are based on the use of the obtained means as the best estimates of the true means. Therefore, neither statistically significant differences nor confidence intervals are reported throughout this study since their inclusion would not have an appreciable impact on the inferences, analyses, or conclusions. The ranges of 95 percent confidence intervals are, however, reported on page 10. The analyses are based on the tendencies of means and mean differences over many individual questions, or on the analysis of the narrative data with the means providing an indication (best estimate) of the overall degree (magnitude) of a phenomenon's presence or influence. It is appropriate in this type of analysis to use the obtained means as the best estimates of the true means, the practice which was followed.

Sources of information about CNR drawn on in this report

A. A Faculty Review of the Experimental Field Major in Conservation of Natural Resources (the Messenger Report), October 1974, (105 pp).

B. Conservation of Natural Resources Field Major: University of California, Berkeley, 1978, Paul Gersper.

C. The CNR Student (Past and Present) and Work Here-After, Fall 1977, Kim R. Hansen (CNR graduate 1978).

D. Annual reports of the CNR Resource Center Coordinator, and the Student Opportunities Coordinator.

E. Extensive historical material, reports on classes, student projects, and internship reorts, all on file in the CNR Resource Center.