



PERSPECTIVES ON THE NURTURE OF GEOGRAPHERS WITH SPECIAL REFERENCE TO CSU, CHICO

James F. Petersen

"In the long run the best evaluation of a college education is likely to result from studies of alumni. What are they like...years after graduation? How have they been influenced by college experiences?" (Freedman 1964)

Introduction

It should be an unusual surprise to encounter a geographer-colleague who also graduated from my undergraduate *alma mater*, California State University, Chico (CSUC). Nevertheless, this situation has occurred to me on several occasions, which made me wonder if it is coincidental, or if the program at Chico has produced an inordinate number of undergraduates who later would complete a Ph.D. in geography. Further, if this is true, why is it so?

A wide number of factors can influence a student's decision to seek a doctorate. Astin (1963; 1977) examined the motivation of talented undergraduate students toward earning a Ph.D., and found that individual experiences in a college environment are more important than a student's

Dr. Petersen received his Bachelor's and Master's degrees in Geography at California State University, Chico. He is Associate Professor of Geography and Planning at Southwest Texas State University, San Marcos, Texas.

educational or family background. Heist et al. (1961) found that schools with a high productivity of future scholars generally benefited from quality students and a "fortunate combination of faculty and student expectations, interests and values."

This may have been the case at California State University, Chico, which has an apparently high number of undergraduates (about 30, according to departmental information) who later went on to complete a Ph.D. in geography. CSU, Chico has been a regional college/university during the time that the Geography Department has been in existence (since 1966), with a small master's program since 1970. On a nationwide scale, the geography program at CSU, Chico may not be widely known. The department could be referred to as one of the often under-rated, "overlooked" departments of geography (de Souza et al. 1981). Yet, as de Souza, Vogeler, and Foust suggested, there are many ways to evaluate the contributions of a department to its students, the university, the discipline, and scholarship in general. The productivity of baccalaureate graduates who continue their education to receive a Ph.D. is one indicator that has been used to estimate undergraduate program quality (Hanson 1984; Hall 1984).

Data from the *Membership Directory* of the Association of American Geographers (Association of American Geographers 1990) reveal a total of 2150 Ph.D. geographers with undergraduate degrees from 430 different institutions in the United States. These data represent a mean of five geography Ph.D.s. per school with a range from 1 to 68. Based on baccalaureate origins of the AAG membership nationwide for Ph.D. geographers, CSU, Chico ranks 25th overall (tied with the University of Utah and Columbia University), and seventh among non-doctoral granting institutions. In

California, CSUC ranks third after UC Berkeley (68) and UCLA (64), the two highest rankings in the nation.

Considering its size and university mission, CSU, Chico has produced a respectable one-quarter to one-half the output of future geographers compared to these much larger, "flagship" schools. An exact estimate is difficult, because a majority, but not all, academic geographers belong to the AAG. Sixteen Chico graduates are members of this organization, roughly half of the total alumni with Ph.D.s. Table 1 shows the rankings of U.S. schools in terms of baccalaureate origins of Ph.D. geographers. Table 1 lists the top 25 schools overall including those that grant a geography doctorate. Table 2 lists the top 25 institutions that do not grant a geography Ph.D.

Most of these schools have undergraduate and/or master's level programs, but some have no geography degree program at present. Boldface type in Table 1 indicates that there is no doctoral granting geography department at that institution. While it is clear that the large, doctoral institutions dominate in numbers per institution, the role of non-doctoral institutions should not be underestimated. The baccalaureate origins of geographers in the United States are widely dispersed, and several non-doctoral universities have an excellent record of developing future geographers, particularly Wayne State, Dartmouth, Valpariso, Illinois State, and Brigham Young. These raw rankings do not consider school or departmental size.

An examination of the data in Tables 2 and 3 generates several germane questions. If certain schools have generated a particularly high rate of undergraduates who go on to earn a doctorate in geography, what are some of the reasons for this high productivity? Further, what are the attitudes of professional geographers relative to their undergraduate ex-

Table 1.

U.S. Undergraduate Origins,
AAG Membership, 1990: Top
25 ranks for all institutions
including those with Ph.D.-
granting geography depart-
ments.

Rank	School	Graduates
1	UC BERKELEY	68
2	UCLA	64
3	WISCONSIN	51
4	MICHIGAN	40
5	WASHINGTON	39
6	MINNESOTA	37
7	CLARK	36
8	WAYNE STATE	29
9	CHICAGO	27
9	DARTMOUTH	27
11	SUNY BUFFALO	24
12	HARVARD	22
12	PENN. STATE	22
14	INDIANA	21
14	MICHIGAN STATE	21
14	OHIO STATE	21
17	COLORADO	20
17	VALPARAISO	20
19	ILLINOIS	19
19	SYRACUSE	19
21	BRIGHAM YOUNG	17
21	ILLINOIS STATE	17
21	KENT STATE	17
21	TEXAS	17
25	CSU, CHICO	16
25	COLUMBIA	16
25	UTAH	16

Institutions without a Ph.D. granting geography department are in bold face.

Table 2.

U.S. Undergraduate Origins,
AAG Membership, 1990:
Top 25 ranks for institutions
not offering a Ph.D. in geog-
raphy.

Rank	School	Graduates
1	WAYNE STATE	29
2	DARTMOUTH	27
3	HARVARD	22
4	VALPARAISO	20
5	ILLINOIS STATE	17
5	BRIGHAM YOUNG	17
7	CSU, CHICO	16
8	MISSOURI	15
8	IOWA STATE	15
10	SAN DIEGO STATE	14
11	WEST CHESTER	13
11	CSU, NORTHRIDGE	13
11	ANTIOCH COLLEGE	13
14	SLIPPERY ROCK	12
14	MIDDLEBURY COLL.	12
14	MIAMI UNIV.	12
14	FLORIDA STATE	12
18	SAN JOSE STATE	11
18	INDIANA U. PA.	11
20	WEST. ILLINOIS ST.	10
20	U.S. MIL. ACAD.	10
20	MARSHALL	10
20	GEO. WASHINGTON	10
20	E. ILLINOIS ST.	10
20	CARROLL COLLEGE	10
20	BUCKNELL	10

Note: some institutions listed do not offer a baccalaureate degree in geography.

periences? Do they feel that their experience was influential in their career choice, and is there some agreement about the factors that were influential to them? This study seeks to explain the high productivity of future geographers by the CSUC department as one example of a non-doctoral institution. The CSU, Chico case study should offer some insights into the process of encouraging talented undergraduates to seek further education in the discipline. A question to consider is whether or not Chico graduates have significantly different attitudes about their undergraduate experience, in comparison to the attitudes of a general sample of geography Ph.Ds. Another important concern is developing an understanding of the impact that undergraduate training may have had on a person's decision to continue with graduate school and to seek a career as a geographer.

Research Design

Attitudes of Ph.D. geographers towards their undergraduate experiences were tested by a mail survey. A questionnaire was mailed to 20 Chico graduates (all Ph.D. geographers who could be located, including five non-AAG members), and a second group of 75 geographers from the *AAG Directory*. The AAG group was limited to persons holding an earned doctorate (presumably in geography) who received their undergraduate degree from a university in the United States, but otherwise participants were randomly selected. Persons with foreign undergraduate degrees were not included in this study, as their training may not be directly comparable to programs in U.S. schools. Of 95 inquiries, 65 were returned, a fairly good response rate (sixty-eight percent) for an unsolicited questionnaire. Sixty-four percent of the AAG group and eighty-five percent of the Chico group returned the questionnaire. The Chico

group did not include the author. An introductory letter accompanying the questionnaire explained that gathering information about the potential impacts of one's undergraduate program was the purpose of the study. The goal of considering one particular school was not mentioned in the correspondence.

The questionnaire was comprehensive, yet brief enough to encourage a satisfactory return rate. In developing the format, questions concerning a wide variety of potential influences were included, and organized into three parts. Section one contained eighteen questions concentrating on participants' attitudes about potentially important influences in their decision to continue with graduate school, and to become a professional geographer. In this part, the scale of responses ranged from very important influence (3), important influence (2), little influence (1), no influence (0), negative influence (-1), or not applicable. Section two concerned actual experiences in the respondents' undergraduate program, their professional careers today, and relationships between these two factors. Section two had an even division of positive and negative responses: strongly agree (2), agree (1), neutral (0), disagree (-1), and strongly disagree (-2). Because of the unequal scaling (which seemed appropriate to the questions), and a different intent, mean responses from the two sections are not directly comparable.

Section three provided background information. Questions here dealt with whether the respondents are dominantly research- or teaching-oriented today, the nature of their current department, and their professional lives. Another page was provided for supplemental comments.

A potential for bias exists in a questionnaire written by a member of a target group in the survey, and efforts were undertaken to mitigate this problem. In other words, a positive

response by the Chico group might to some extent be an artifact of bias introduced because a CSUC alumnus designed the study. This possibility was minimized through review of the questionnaire by several colleagues, and subsequent revision. As a post-test check, factors listed by respondents on the open-ended part of the questionnaire were examined. However, on the open-ended portion of the questionnaire, very few unaddressed points were mentioned, and none of these points related directly to the respondents' undergraduate experiences. For example, one factor mentioned was the influence of travel on developing an interest in geography.

Questionnaire Analysis

The twenty-eight questions dealing with undergraduate experiences and career influences were tested for significant differences between the mean responses from each group. The Mann-Whitney U-test, a distribution-free test of association, was applied because it is appropriate to Likert Scale (ordinal) measurement, and the response data had a non-normal, skewed distribution.

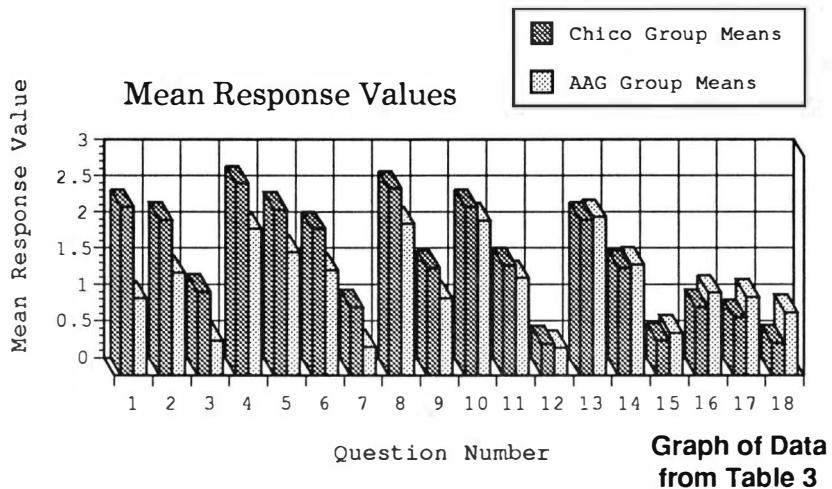
Individual questions for each section of the questionnaire are shown in Tables 3 and 4, ranked in order of difference between the mean response for each group. These tables each have a corresponding graph to illustrate response levels. A negative number indicates a generally negative response to the question. The results show that there are significant differences in response to several questions between the Chico and the AAG groups, but the overall responses were not greatly different. A Spearman's Rank comparison of mean responses for the eighteen questions in section one yielded a strong positive correlation between the two groups ($\text{Rho} = 0.76$). The correlation suggests that in

Table 3. Section one questions ranked by differences between the group response means:
Boldface type represents statistically significant difference (.05 level).

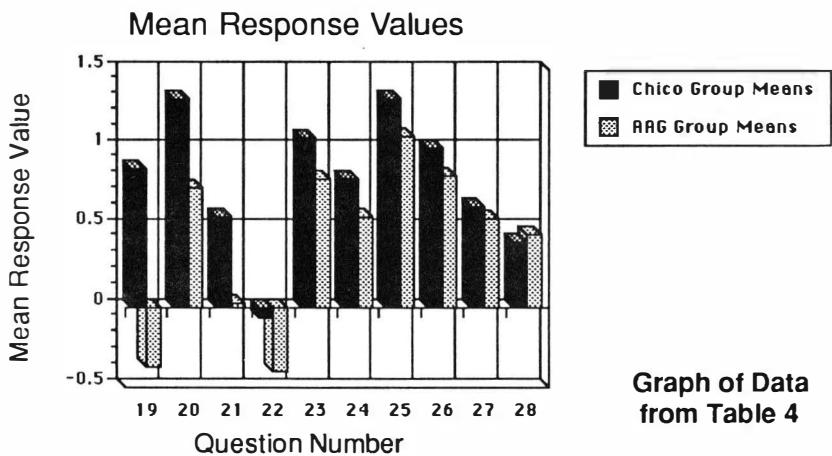
QUESTION	Chico			AAG		
	Mean	Rank	N	Mean	Rank	N
RATED HIGHER BY THE CHICO GROUP (N≤ 17):						
1. Recommendation of this career by a geography faculty member.	2.31	3	17	1.05	12	46
2. Teaching style of a particular geography professor (or several).	2.13	6	17	1.40	8	45
3. Attending a conference of professional geographers.	1.14	12	15	0.47	16	38
4. Influence by a mentor-professor in geography.	2.63	1	17	2.00	4	44
5. The eclectic approach of geography, and its holistic nature.	2.27	5	16	1.68	5	44
6. Geographic knowledge as an enrichment of one's everyday life.	2.00	8	16	1.43	7	45
7. Involvement in geography student groups (geog. club, GTU).	0.93	13	15	0.38	17	37
8. Enthusiasm for the discipline of geography, shown by a professor.	2.56	2	17	2.07	3	46
9. The opportunity for field work.	1.47	10	16	1.05	12	43
10. My undergraduate course work in geography (content knowledge).	2.31	3	17	2.12	2	44
11. Opportunities for research into geographical problems.	1.50	9	17	1.33	9	42
12. Inspiration by visiting geographic scholars/speakers.	0.43	18	15	0.37	18	37
RATED HIGHER BY THE AAG SAMPLE GROUP (N≤ 48):						
13. The discipline of geography itself, its content and approaches.	2.13	6	17	2.17	1	44
14. The potential applications of geography to real-world problems.	1.47	10	16	1.51	6	44
15. Discovery of the area near your undergraduate institution.	0.47	16	16	0.58	15	43
16. Opportunity for specialization in a sub-discipline of geography.	0.93	13	15	1.13	10	42
17. Camaraderie with geography student peers.	0.79	15	15	1.07	11	44
18. Interest in the research program of a geography faculty member.	0.44	17	17	0.86	14	39
OVERALL MEANS (ON A SCALE OF 3 MAXIMUM)	1.55			1.26		

Table 4. Section two questions ranked by differences between the group response means:
Boldface type represents statistically significant difference (.05 level).

QUESTION		Chico		AAG	
		Mean	N	Mean	N
<u>RATED HIGHER BY THE CHICO GROUP (N≤ 17):</u>					
19. As an undergraduate, I was <u>encouraged</u> by a faculty member to attend a meeting of academic/professional geographers.		0.87	16	-0.37	40
20. As an undergraduate, one or more of my professors recognized and nurtured my potential as a future professional geographer.		1.31	17	0.75	43
21. As a professor, my approach to <i>undergraduate</i> teaching is somewhat similar to that of my <i>undergraduate</i> professors.		0.56	17	0.02	48
22. In my geography undergraduate program, I gained a good idea of what my own career as a geographer would be like today.		-0.07	16	-0.40	43
23. As an undergraduate, I received a fair amount of attention (academic interaction or counseling) from geography faculty.		1.06	17	0.80	43
24. My geography undergraduate program prepared me well for the graduate school experience (compared to my grad. school peers).		0.80	16	0.56	44
25. Dealing with undergraduates today, I consider that some of them may have the potential for continuing on to doctoral-level education.		1.31	17	1.07	48
26. The process that led me to become a geographer was coincidental, due to circumstances rather than by design.		1.00	17	0.82	48
27. My undergraduate education has influenced my professional endeavors (e. g., research interests) today.		0.63	16	0.55	40
<u>RATED HIGHER BY THE AAG SAMPLE GROUP (N≤ 48):</u>					
28. My approach to <i>undergraduate</i> teaching is somewhat similar to that of my <i>graduate-level</i> professors in their undergraduate courses.		0.40	16	0.45	47
OVERALL MEANS (ON A SCALE OF 2 MAXIMUM)		0.79		0.43	



Graph of Data from Table 3



Graph of Data from Table 4

terms of relative importance of these influences, Chico graduates are much like the AAG sample. The factors that exerted a strong influence on the Chico graduates were also important among the AAG group, but the Chico respondents tended to be more positive in their responses.

In general, the CSUC alumni were very positive concerning the impact of their undergraduate experience (overall

Table 5. Important Influences for Becoming a Ph.D. Geographer: Groups by Rank

<i>Chico Group</i>	<i>AAG Group</i>
1. Influence by a mentor	1. The discipline of geography by itself, its content
2. A Professor's enthusiasm for geography	2. Influence by a mentor
3. The eclectic/holistic approach of geography	3. Undergraduate course work
4. Opportunity for field work	4. A Professor's enthusiasm for geography
5. Undergraduate course work (tie)	5. Applications to real-world problems
5. Recommended career by a professor (tie)	6. Research opportunities in geography
5. Geography enriches everyday life (tie)	

[bold = shared between both groups]

means for Chico = 1.55 and AAG = 1.26). In section one, which primarily concerned attitudes and influences, the Chico group had a higher response level on twelve of the 18 questions. Five differences were significant at the .05 level. Of the ten questions in section two, concerning actual events and experiences, the Chico group ranked nine out of ten with a higher response level (one question was significantly different). In this section, the sole question that was ranked higher by the AAG group dealt with whether the individual's teaching was influenced strongly by graduate experiences (rather than undergraduate experiences).

Strong influences

The statistically significant factors can be grouped to develop several generalizations concerning influence. The strength of mentoring and teaching styles by faculty is especially evident in the Chico group. Although faculty mentor-

ing, undergraduate course work, and enthusiasm for the discipline were also ranked highly by the AAG group, several other points suggest particularly strong influences by faculty at CSUC. These include actively recommending a career as a university professor to talented students and encouraging undergraduates to attend a meeting of professional/academic geographers. Members of the AAG group were strongly influenced by the characteristics of geography as a discipline and the potential for geographic applications.

After completing section one of the questionnaire, participants were also asked to underline the two factors that they felt were most influential. In determining the most important influences, the respondents' choices from the list of 18 may be more valid than the highest mean ranks. This is because in the case of influences, extremes may be more significant than means. A comparison of key factors in Table 5 reveals several differences between the Chico group and the AAG group. Three factors, however, were important to both groups: influence by a mentor, enthusiasm shown by a professor, and undergraduate course work. The Chico group gave great merit to the eclectic/holistic approach to geography, opportunities for field work, career recommendations by a professor, and geographic knowledge as an enrichment of everyday life. The AAG group reinforced their emphasis on the discipline of geography, applications to real-world problems, and research opportunities.

About twenty-five percent of all respondents did not have an undergraduate degree in geography, a factor that is not listed in the AAG Directory. These people were asked to complete the questionnaire and also to list the two most important reasons for their switch to geography in graduate school. Practically all responses fit the eighteen influences in section one. Most of these people switched to geography because of positive contact with undergraduate geography teaching and faculty. A notable exception was the feeling

that geography graduate work would provide an appropriate extension of a respondent's undergraduate major.

Weak Influences

The low rating of "interest in faculty research programs" reflects a generally modest emphasis on introducing research in many undergraduate programs. This response also reinforces the idea that strong teaching makes a crucial contribution to the discipline by attracting talented students to continued study. Two other factors that were not ranked high by the participants were, influences by a visiting speaker, and participation in student geography groups. These factors, however, may be important despite the low scores, because they are strongly dependent on the opportunity for, and participation in, activities which may not have been available at all institutions.

A personal surprise was the low rank of "discovery of the area local to your undergraduate institution." Learning the joy of landscape interpretation by discovery in the field was a key element that convinced me of geography's value as a discipline of study, yet this factor was ranked low by the respondents of both groups.

Most respondents from both groups felt that their undergraduate training did not necessarily give them a good idea of what their job would be like today. Few of these present-day professors thought that their undergraduate classes have exerted an influence on their current approaches to teaching. Further, many felt that their undergraduate program did not necessarily prepare them well for graduate school, either. Perhaps the most critical point in this regard is that their undergraduate experience encouraged them in some way to continue their education. These responses underscore the divergent roles of undergraduate and graduate education, as well as the importance of quality training as

defined in terms appropriate for each level of education. As one Chico graduate stated:

"Geography was my interest hub.... I am most happy with my undergraduate education.... Graduate school, however, made me a mature scholar and a professional."

The Nurture of Geographers

Recently, the leadership of the Association of American Geographers has called for an effort to increase the number of geographers in the United States (Abler 1989; Cohen 1990). Based on differences and similarities between the two groups examined in this study, a few observations can be made concerning the process of nurturing future Ph.D. geographers. It is not likely that any of these factors will interfere with the process of educating all undergraduates, whether or not they continue on to graduate studies. First, strong teaching is important at the undergraduate level to generate interest in the discipline because few students begin with a major in geography. Karen and Mather (1986, 96) have criticized geography professors for their "widespread professional snobbishness" toward those colleagues who emphasize good teaching. This study has shown that a professor's enthusiasm for the discipline is a particularly effective inducement for students to seek further education. Enthusiasm is often most effective when it is supplemented with realistic information about what advantages and applications geographic knowledge offers a person in life, scholarship, or perhaps the job market. Second, faculty can take an active role by recognizing talented students and encouraging them to continue their geographic studies in graduate school. This is particularly important to the discipline, because many geographers attribute their career choice to "accident" or serendipity, rather than to de-

sign or plan (question 28, section 2). Martin Kenzer, a Chico alumnus (BA 1974) has noted, in *On Becoming a Professional Geographer*:

"One of my initial thoughts about graduate school, curiously enough, was no thought at all. ...An instructor asked me where I intended to pursue my graduate degree.... The question elicited a total blank on my part" (Kenzer 1989, 2).

In addition, organized events that build interest in the discipline may be more important than this survey has indicated. The role of geography student groups on campus helps to build a sense of identification with the discipline. Of primary importance in this study was the relatively high rate of Chico undergraduates' attendance at geography meetings, an activity which can provide a glimpse at aspects of the discipline that students will not see on campus.

The results of this survey reveal much about the undergraduate experiences of Ph.D. geographers. The apparently successful Chico program outlines one model for encouraging talented undergraduates to consider a career as a professional geographer. CSU, Chico is only one of the non-doctoral departments that has produced a high number of future geography Ph.D.s., and every department may offer unique elements in its approach. The basic model for developing future geographers, however, involves mentoring, enthusiasm for the discipline, strong teaching, and taking an interest in students with potential.

Conclusion

Fifty-nine percent of American geography Ph.D.s. received their baccalaureate degree from a school that does not grant the doctorate in geography (based on 1990 AAG Directory data). Only a small percentage of undergraduate will continue through a doctoral program, and doctoral-

granting departments alone do not meet the demand for qualified graduate students. Thus, Ph.D.-granting departments depend on a supply of graduate students from a wide range of colleges and universities. Although John Fraser Hart (1968) regarded this as a lamentable "parasitic" situation for prestigious geography departments, the process is actually symbiotic. Teachers of geography at all levels should be committed to the duty of inspiring students and encouraging particularly talented individuals to continue their studies in the discipline. Doctoral departments have a responsibility to develop future professors who will actively contribute to this cycle. Ron Abler (1987, 552) has recently observed that, "...teaching plays (a critical role) in the ongoing education of the professorate."

Among disciplines taught in the university, geography is a relatively small one (Abler 1987; Hill and LaPrairie 1989). Geography has even been referred to "endangered," based on past reductions of its range in the academic world. These demographic conditions underscore the importance of "eternal vigilance" (Natoli 1986) in maintaining the health and vigor of geography. All species, endangered or not, base their survival on nurturing new generations. For academic departments in the universities, a part of the process is producing new Ph.D.s. to continue to advance the discipline, a responsibility that is frequently considered to be the eminent domain of Ph.D.-granting departments. In reference to an individual's doctoral education, it is often heard that, "So-and-so trained under Professor Blank at State University." Generally, this statement is issued as if it completely explained the character, development, intellect, and skills of the person in question. Yet, "So-and-so" began an education not as a fledgling Ph.D., but rather as an undergraduate. Although doctoral-level graduate training is preeminent in the development of professional and academic geographers, it is not likely that it erases every vestige of knowledge and

intellectual growth that was gained while earning a baccalaureate or master's degree. Further, it is clear that the role model for many professors was a faculty member at a pre-doctoral level of education, and that first impressions of the discipline often remain strong. Without stimulus at the *undergraduate* level to generate interest in the discipline and build a desire to continue with graduate studies, talented individuals may be lost to the geographic gene pool. The importance of undergraduate training cannot be denied or overlooked, whether it concludes a person's formal education, or marks a first step toward becoming a geographic educator/scholar, culminated by completion of the earned doctorate.



Acknowledgements

I am grateful to my geography colleagues who completed the questionnaire, particularly those who offered supportive or critical remarks. Thanks are also due to: Kevin Klug of the AAG office for assistance with data acquisition, Susan Barnes, Associate Dean of Curriculum and Instruction, SWTSU, who made suggestions concerning the questionnaire, and Fred Day (Geography and Planning, SWTSU) for his critical reading of the manuscript. Bruce Bechtol at CSUC helped with the Chico Alumni list.

REFERENCES

- Abler, R.F. 1987. What shall we say? To whom shall we speak? *Annals of the Association of American Geographers*, 77: 511-24.
_____. 1989. Executive Director's column. *AAG Newsletter*, 2. Association of American Geographers, 24: 8.
Association of American Geographers. 1990. *AAG Membership Directory*, Washington, D.C.

- Astin, A.W. 1963. Differential college effects on the motivation of talented students to obtain the Ph.D. degree. *Journal of Educational Psychology*, 54: 63-71.
- _____. 1977. *Four Critical Years*, San Francisco: Jossey-Bass Publishers.
- Cohen, S. 1990. President's column. *AAG Newsletter*, 1-2. Association of American Geographers, 25: 2.
- de Souza, A., Vogeler, I., and Foust, B. 1981. The overlooked departments of geography. *Journal of Geography*, Sept.-Oct.: 170-175.
- Freedman, M.B. 1964. What happens after college: studies of alumni. In Nevitt Sanford (ed.), *College and Character*, 243-250. New York: John Wiley and Sons.
- Hanson, T.C. 1984. *Baccalaureate Origins of Ph.D.s, 1920-1980: College Rankings According to Educational Productivity*. Ashland, VA.: Randolph-Macon College.
- Hall, A.E. 1984. Starting at the beginning—the baccalaureate origins of doctorate recipients, 1920-1980. *Change*, April: 40-43.
- Hart, J.F. 1968. The undergraduate major program in geography. In J.F. Hart (ed.), *Undergraduate Major Programs in Geography*, 1-13. Association of American Geographers Publication No. 6, Washington, D.C.
- Hill, A.D., and LaPrairie, L. 1989. Geography in American Education. in Gaile, G.L., and Willmott, C.J. (eds.), *Geography in America*, 1-26. Columbus, OH: Merrill Publishing Company.
- Heist, P., McConnell, T.R., Matsler, F., and Williams, P. 1961. Personality and scholarship. *Science*, 133: 362-367.
- Karan, P.P., and Mather, C. 1986. The trouble with college geography. *Journal of Geography* 85: 95-97.
- Kenzer, M.S. 1989. Introduction. In M.S. Kenzer (ed.), *On Becoming a Professional Geographer*, 1-8. Columbus, OH: Merrill Publishing Co.
- Natoli, S. 1986. The importance of redundancy and eternal vigilance. *Professional Geographer* 38: 75-76.