Melvin Marcus

Mel Marcus is a big bear of a man—about 6'6" and 250 pounds. His physical presence is his most striking attribute. A woman, at the conclusion of his lecture, said: "He looks like a geolo-
 gist. I married one." Indeed, he was originally a geology major at Yale. His face has a Slavic look; his mother was from Ukraine and his father from Norway. He has the somewhat rumpled appearance of a man ill-suited to the usual cost and tie and much more comfortable in field gear.

Considering his imposing size, Marcus could appear domineer-
ing and threatening to people, but this is offset by his low-key, mild personality. This is manifest most strikingly by his soft, almost soothing, voice. The big bear is a friendly bear and many people may find his personality appealing for this reason; a perceived threat is replaced by a reassuring personality. He is naturally gregarious and mixes well with people, a trait not always shared by other field workers.

His early avocation (mountain climbing) led ultimately into a related vocation as a high-altitude glacial geomorphologist. His career has taken many upward turns on seeming chance events. He was included in a field expedition while still a student at Yale, for example. On closer examination, however, these seeming chance events were made possible because he was in the right place at the right time. He has taken the trouble to become ac-
quainted with key people, whether they are his academic col-
 leagues in geography, Arizona State government officials, or individuals in one of his favorite areas for student field trips, the San Juan Mountains of Colorado. He is part politician, in the better sense of the word, witness his presidency of the Associa-
tion of American Geographers.

Marcus sees to be a natural leader. He has been in leader-
ship positions in the Muon project, as chairman of the depart-
enent at Arizona State, the center for Environmental Studies at Arizona State, and in the AAG. At a meeting or con-
ference when things drift, he steers the group back on track while disclaiming any intentions of trying to run things or dominate. Individuals are not given their marching orders but they willingly fall into place without even realizing it. People look up to Mel Marcus—in more ways than one.

Q: How did your early background lead you into geography?
A: I grew up in Seattle, Washington and I suspect that had a
great deal to do with my career choice. By the age of ten I had
come involved with mountains, both the Olympics and the Cascades. When I was 13, I was into serious mountaineering. Hope climbing took me into a variety of unexplored environments, especially the northern Cascades. The Seattle Mountaineers gave a magnificent three-year course on mountain climbing, lore, geology, flora and fauna. I began to learn more and more about ice and snow; it was a matter of survival in those days. Nearly every weekend I was climbing or skiing.

I went to Yale for my undergraduate work intending to be a
history major (don't ask me why). I had the choice of taking
either psychology or geology for a year and I elected geology.
The first geology course I ever had as a freshman was taught by
Richard Foster Flint, the well-known glacial geologist. He was a
great teacher of the old school—a formal and dignified lecturer;
every class began and ended precisely on time. The elegant lect-
ures were well organized and smoothly and precisely conducted. I became immediately enamored and went into geology.

At Yale I continued my hobby of mountaineering. I was pretty
well known in that field in those days, doing some ascents and
difficult climbing. I would go down to the American Alpine Club
in New York City to visit the library and become acquainted
with people. One day I was there and met Maynard Miller who was about
to lead an expedition to the Juneau Ice Fields in Alaska. It was
a Harvard Mountaineering Expedition and perhaps in an ecumenical
mood, he invited me (a Yale man) along as a packhorse. This was
at the end of my freshman year; I had already elected to special-
ize in glacial geology, having fallen under Flint's spell.

So, I found myself on my first expedition to a totally unex-
plored area at a time when glaciology as a field hardly existed
outside a few founding fathers in Scandinavia and England. I dis-
covered that people were paid to go on these expeditions and I had
thought this was what you did on your vacation! I realized then
and there that somehow alpine environments and Marcus were going
to get together for a long time. It was pure dumb luck to stumble
onto this because one of the hardest things to crack was expedi-
tionary field work parties. I spent some summers on the Juneau
ice field—rising from packhorse to field assistant, to scientist,
and learning glaciology on the job because there were few courses
on the topic in those days.

I didn't finish my degree at Yale. The Korean War came along
and my urge to fly airplanes was just too great. So I signed up
in the Air Force with a year of school to go. I became a pilot and flew in Korea and Japan. I enjoyed flying very much. I have kept it up although I don’t do as much now because of the expense of children in college. I have used flying in my field work as a geographer.

I had married my wife, Mary Ann, in Japan. We were discussing our future plans and by some magical process—I still don’t know why—we decided I would go back and be a geographer. My only exposure to geography were two courses while I was in college, and these had been heavily regional description and thus not very inspiring courses. Something, however, must have come through about what geography was. Lo and behold, when I went into the field, it turned out to be exactly what I thought it would be. My wife and I still talk occasionally about it.

Since we didn’t feel Yale was right for geography, we decided to go elsewhere for my senior year. Again, it seemed pure fate when we found a place in Miami. We had been in Miami a little before we got to Yale and there was a place with an extra cottage—such are decisions made when you’re young, married, having your first child, and don’t have much money. It turned out to be a good experience and I was pleased with the geography faculty at Miami. One of the instructors was a Chicago graduate who rather brainwashed me and I felt that sooner or later I would go to Chicago for graduate work.

Q: Chicago doesn’t seem like the appropriate place for a glaciologist.

A: No, it wasn’t. I did go to a rather appropriate place for my masters, however, the University of Colorado. The faculty there said you should be going to Wisconsin or Syracuse in physical geography. I had the notion I wanted to work in human environments. I did a masters thesis, "The Economic Geography of Steamboat Springs, Colorado." It was really not what any modern economic geographer would call good economic geography, but I sure picked the right area. What I was really doing was looking at alpine environments and how people use them and live in them.

The reason I wanted to go to Chicago—and it probably didn’t make sense to a lot of people—was because the faculty there said, “Come here and ski or ski. We’re not going to make you take a lot of courses.” At that time Wisconsin had a neat imposing array of courses and comprehensive exam subjects that one had to take, whereas Chicago just kind of a free-wheeling operation. It was a pretty self-motivating kind of place and that’s what I felt I wanted. I was not impressed by some of the people there, which included “Occasional Faculty” like G. Warren Thornthwaite and John Russell Foster. Rather from the Laboratory of Climatology in New Jersey. I worked with Wesley Teale, an excellent meteorology department, and Mark Nelson, then a young geomorphologist in geology.

I was very much influenced by a number of people at Chicago even though I didn’t work directly with them. Chauncy Harris walked in one day and told me, “Marcus, you’re a glaciologist, go do glaciology.” (I had been thinking of doing some human impact study for my dissertation.) He was right of course, I didn’t have enough background to take on the man-land relationship. I also spent a winter in Mexico with Phil Wagner working with anthropologists. This gave me field experience in the hands of a Sauer-trained and very imaginative geographer. He had a great effect on the things I’ve read and learned about cultural geography.

Gilbert White was also at Chicago and my contemporaries were students like Burton and Kates who were developing with White the perception of hazards approach. I saw myself operating as a physical geographer through the first stage of my career and then adding on my interest in human geography later and that is just about the way it has turned out. I spent very little time in Chicago; I was in Chapingo, Mexico or in New Jersey at the Laboratory of Climatology. Of course, the Thornthwaite influence was an impressive one on almost anyone who came in contact with him.

Q: In the Chicago publication series, which is mainly dissertations, I have noticed that many of the authors write in their preface about the stimulating intellectual atmosphere of the geography department at Chicago. Was that your experience?

A: Yes, and this was especially true of the graduate students. Roe that the faculty were not stimulating, but the real action was there on the fourth floor of Roosevelt Hall. We were all throwing ideas at each other. It’s interesting that hardly any of us were in formal courses; there were all kinds of reading and independent research courses. We didn’t sit in classes where we were manipulated to talk to each other, we did it mostly on our own. A lot of people didn’t make it through the Chicago program. There was a lot of stimulation among the students, but if you weren’t self-motivated, you perished. I suspect Berkeley had much in common. I think there is one advantage to that kind of education—self-education with occasional counsel. You know if that you survive then, you’ll probably survive later. People who do that will be productive; they haven’t been dragged along to completion to die afterwards for lack of further supervision. It does generate independence.

Q: Were the comprehensive examinations the critical point?

A: There were three critical points. When you arrived at the First Quarter, everybody was together and you were passed from professor to professor. They gave diagnostic tests which decided what further work a student needed. Sometimes the faculty response persuaded the student to go elsewhere if there were too many demands made for further training. The key was a two-week field exam, a problem-solving exam which required a written report of presumably publishable quality. The other exam was comprehensive, and in those days it was comprehensive. Half of it was on anything, and all faculty were encouraged to show up; the other half was a defense of the proposal for the dissertation.
research proposals as a referee for one of the granting agencies. I look for the same kinds of things in the proposals whether it's in physical or human geography. These are related to problem statement, design, hypotheses, etc. Both are usually looking at processes operating through and on phenomena.

The geographers who operate in a more traditional way, I guess I mean older mode, perhaps do operate a little more intuitively than physical geographers. There is a certain amount of acquisition of data without a broad statement of problem, a certain "playing it by ear" that I've detected in the work of some cultural geographers and historical geographers. I'm not suggesting that's bad because I think that is sometimes an effective research approach to the problem being attacked. I wouldn't want to be critical, for example, of the so-called Berkeley school of cultural geography; much of their research is very fine. There is a scientific method in it even though it is obscured by a lot of Berkeley folklore and an impression of an ad hoc methodology. I don't think it's ad hoc at all. I think these people know exactly what they are doing.

Q: Does a piece of research in physical geography occupy a clearer niche in the structure of that physical specialty? One of the problems I have with cultural geographers is that they may be interesting individual work, but they don't seem to be the least bit interested in telling you how it fits into the general structure of cultural geography. In fact, it seems to me that no one has attempted to construct a structure for cultural geography whereas I assume in the physical sciences this is pretty elaborate.

A: Yes, I agree with what you're saying. In my talk today, I alluded to presenting problem statements in a context or conceptual framework so that the work was to be part of some other larger body of knowledge. In physical geography I think we tend to be pretty good citizens in this respect.

Q: One thing that seems interesting to me about physical geographers is that many, and perhaps you are among them, tend to go from a more physical to a more human type of emphasis in their research. As far as I know, Thornthwaite may be the major exception.

A: His dissertation was on the towns of Sweden and then, he seemed to move into climatology.

Q: Thornthwaite became known as a physical geographer but, one thing that was not at all that apparent to geographers and that people overlook, is that a large part of Thornthwaite's work was in consulting. There he was really dealing in applications of physical geography to agriculture, to industry, and waste disposal systems. I suppose you could call him one of our early environmental geographers in the modern sense of the word 'environmental'.

A: He was a very practical man and some of the things geographers know best about him are what he considered his more trivial accomplishments.
I'd like to say a word or so about Thornthwaite because one of the things I mentioned in my presidential address that disappo\nod he about the review of geography the past 75 years in the Ana\nal was the lack of a Thornthwaite connection. They identi\ified certain groups—Chicago, Wisconsin, Washington, etc.—but the impact of Thornthwaite in American geography was generally not impressed. There was an underground impact through a series of his students, people who came and worked with him at the Laboratory of Climatology or visited and talked with him. It's not the potential evapotranspiration per se for which he is so well known; rather it was his feeling of the need to look at the interface between energy and moisture and momentum exchanges—those fluxes—that occur at the earth's surface. All of us who have come afterwards are in many ways his descendants through our work, and a glance does not resemble anything that he did. He really was teaching us systems before it was very popular, think of this presidential address is one that people ought to look at again to see just how he anticipated much of what became the main pathway of geographical and climatological research in the sixties and seventies.

Q: He needs a biographer.

A: He probably does and there are a couple of good ones around. Maybe what he needs is a posthumous reminiscence of a festschrift of some sort to be given on the other side of the ocean. He was an official, and he could be at times an absolute despot if you were a student working for him or even an employee. Yet, my wife always considered him one of the most chivalrous men she had ever met.

Q: How do you personally generate ideas? Do you try to put yourself into a mood or feeling?

A: I have never done anything terribly formal in the generation of research ideas, although I tend to structure my proposals fairly formally. So many students seem to have a terrible time coming up with problem statements and in my experience that is the most common obstacle preventing many students from moving on and finishing the PhD. Yet to me, it seems that one can hardly walk down the street without tripping over problems; I see them all the time. I can accept that a lot of people have this trouble without understanding why this is so. We try to teach problem identification and formulation to be taught. You can teach people how to write them up but it's very hard to teach them what are proper questions. This seems sixty intuitive.

Q: I think there's a certain passion involved; a person has to be really interested in the topic. Yet, I know one person who certainly doesn't lack interest in a topic but nevertheless can't formulate a half-way decent question about it.

A: Yes, there may be interest in the topic; I suppose one primary requisite is curiosity, but that's not enough. I think it is this ability to put the question within a context; it sounds a little like a simple thing to do and yet some people spend a life time not being able to, whereas others can spill them out one after another. I will sometimes walk with my students—through a canyon, a woodland, or a glacier and look at the phenomena and the processes going on. We start asking questions and inside of ten minutes, if we get the right combination, we discover a lot of questions that haven't been answered. And then you'll have a student along you can hit over the head again and again and he still doesn't think the problem before his eyes. I'll be getting all excited, and the students will wonder what it's all about. I suspect this is part of productivity in any field; the people who are hand-carried through their degrees by their professors, because they don't have a good sense of problem are the ones who aren't productive later on. They never quite know what to come to grips with. I think another problem is that some people are always looking for something bigger than they need. They want to work on an earth-shaking level of research. Problems are usually simple little things.

Q: Garrison always used to say, 'Think small!' which is easy to say but difficult to do. I think part of the reason is that you have to have a frame of reference to realize the importance of the smaller problems. If you come in cold turkey, you may not recognize them as being as important as they are.

A: Yes, that's well said. One of the hardest things to get students to do is a proper search of the literature. They will often rattle around on the outside of a research area and have this context, I like the 'think-small' idea. Most students, if you ask them to write a one-page research proposal, will come forth with something that requires the combined forces of the UN to solve.

Q: As a human geographer, I think of physical geographers often solving puzzles about physical phenomena. I think of Peirce Lewis' study of the peculiar linear pattern of hills in the Palouse as an example. Is that a correct impression?

A: I suspect there are any number of curious landforms or arrangements of landforms, but I don't think that's the main thrust of research. I think the puzzle they (including Peirce Lewis) are trying to solve is usually how some process works. We all wish, whether we're climatologists or geomorphologists, or whatever, that some day we could come up with that magic, elegant model as William Morris Davis did or perhaps Kloppe, or ELEMENT in biogeography, or Kellogg and Marbut in soils—all those beautiful, elegant and fallacious models that were developed forty or eighty years ago. We backed off from those models and started to look at the pieces again. That's where we were talking about context earlier. People are looking at streams, at mass wasting slopes, and slope retreat, but they're looking at them in the context of trying to understand the larger landscape models.

Q: How do you work up a research design?

A: First of all, I start with whatever broad question or questions that interest me. Then I tend to move towards some set of
hypotheses that are a more formalized way of getting at the subject matter. A lot of people criticize this as overdoing science and worrying about hypotheses and the trappings of science when it's not always necessary. It's an extremely useful way to organize your thinking and it puts you in a position so that you're acquiring the kind of data necessary to test the hypotheses. If you select all the wrong hypotheses, you're in big trouble. So obviously you have to know something about the subject matter. In fact, there is often trial and error in a research project. If you're new to the subject, there's a good chance that you begin to go down some dead ends and have to back up and restructure the design, but the hypothesis gives you a working start. You can look at the more practical questions that arise—the time straits, the financial constraints, the personal constraints, the environmental conditions, stress, etc.). These have to be built into the research design and they will help to determine what kind of sampling will be required. Whether you are a human or physical geographer, you're usually sampling; you have to come up with the appropriate sampling procedures. If you're doing the kind of work I do, you must go into the field and take a series of measurements.

All these things are built into the design, but it's not like one of these neat diagrams in a scientific methodology textbook. There is an in-process and one that is constantly backing and filling, trying to put it together. You're looking up new material, new sources, and a new fugitive set of photographs in someone's office on the other side of the country. You're communicating with your colleagues to get their reactions. To some degree, research design is sequential but it's a constant looping back and forth, even in the field. You show me someone who has gone into the field and done exactly what his original research design stated and came back without changing it. You are looking in these areas, for example, and they come back without changing.

Q: Sometimes in human geography a person goes to a foreign country ignorant of all the problems that can arise (cooperation of the authorities, for example) and they come back without changing.

A: Ahh, with my students and my own research proposals, I have a requirement that there is always a back-up proposal, a second-best alternative. Even in physical geography if you are working in the field at some remote site you may have instrument failure or the power system breaks down. I always look with the student to find a minimum acceptable kind of study that can be salvaged should the desired one fail for reasons beyond the student's control. Sometimes this has to be worked out partially in the field, but the possibility should have been anticipated.

Q: Do you have any examples of 'models' or research that you can give to your students and say, 'if you want to see how it's really done, this is an example.'?

A: Oh my! (pause) There are many. Right now those I'm using, because they're terribly convenient, are those of colleagues in

my own department. The work that Will Graf in geomorphology and Tony Bresol in climatology are doing exemplifies what we want in research. They have clearly stated problems in the context of the field, they tell you what they are hoping to accomplish with the hypotheses, they tell you how data was collected, present the analyses and lead to some very tight conclusions and recommendations for where to go next, again within the broader context.

Q: How do you write?

A: I must write in isolation and have large blocks of time. I'm reasonably facile at turning out one-page administrative letters with ten things going on at once but if I'm writing an article, it's a scholarly piece, I have to be isolated. It usually takes me a day or so to get into it and it seems like I get nowhere. I've learned in my own case that I've just got to hang in and that suddenly it will start to come. Once it does I move fairly quickly in my writing. I do not worry a lot about perfection, once it starts coming I let it keep coming until it dries up and then I backtrack and rewrite. Before I ever submit a manuscript anywhere I've probably rewritten it three or four times. Before I let anyone look at it, I do a lot of my own editing in advance. If I run into a barrier, I forget it and work the other parts. I try to wait a day or more before I reread it because suddenly it becomes crystal clear how terrible it is and where the corrections are needed. Once it's published I still can see all the things I would change. I don't know how to get over a writing barrier except to persevere, jump around, go to something else and then come back to it; often just breaking away helps.

Q: If you were beginning graduate study today, what would you take to prepare yourself for a career in research?

A: I would first make certain I had control of the mathematical and statistical skills including calculus, linear algebra, and systems analysis. I think these would be very useful to draw on as you saw fit. Also, I wish to have computer graphics and such old-fashioned skills as good cartographic training, photo, and remote sensing interpretation. After that I want for background would depend pretty much on the direction I was going within geography.

Q: You've traditionally been involved in basic research but more recently you have moved into the applied research area. What type of applied research have you been doing?

A: I've been involved in several types of applied research—three particular areas I could describe. Firstly, some of it is what you could call participatory applied geography. I'm not sure research is quite the correct word to use, although in the long run, community participation evolves into research. The types of things of this sort that I've been involved in at Arizona are characterized by my membership in the Governor's Commission on the Environment. Also, I've participated on several committees that have been set up to advise on such issues as air-quality monitoring
rules and regulations for both the state and the Phoenix area. I've chaired a special committee that looked at riparian habitats in the state and advised in terms of potential legislation to help protect and manage those riparian zones. I think the main thing is that this type of activity gets the geographer a lot closer to the decision-making process, you're not simply providing isolated report input as you might in research. One begins to communicate with the upper-middle and sometimes the upper-level managers who are the decision makers.

A second type of research is directed to solving particular problems; it has a task orientation. One example was the dust project. The Arizona State Highway Department had become concerned about localized dust conditions which were so dense and blinding that they were causing multiple car-chain accidents. Your dust to blow across the highways, but not in blinding amounts and certain stretches of interstate-10 were more likely to have this condition. Various expensive engineering solutions, for example, had been proposed. We studied the local soil, vegetation, and terrain and suggested land-use modifications which would alleviate the conditions. Our project was in the same category as the "sludge project". There is a large desalinization plant in the Phoenix area along the Colorado River. This is in accordance with the international treaty with Mexico. One of the problems with desalinization is the great amount of sludge removed in the treatment of the water—essentially a solid material from the sediment load—and it has to be disposed of somewhere. It amounts to several hundred tons a day and if this is projected into the future you're looking at several hundred tons per day, 365 days a year for fifty to seventy years—by the life of the plant. Our problem was to suggest one of several different areas was the most appropriate one for the disposal of the sludge. This required a hard decision at the end to indicate the best choice. It's a decision that will have an environmental impact for each of the proposed disposal sites.

A third kind of application of geographic knowledge that I have been involved with is somewhat similar to the one I've just talked about except the format in which it is delivered is different, that is, work as an expert witness. This is a situation where one's expertise is brought to bear on a particular problem which may be critical to the disposition of a legal suit. I've done a few of these and one is an entirely different milieu. There is a much greater question of confidentiality; you are really working for one side and not the other. You must maintain your objectivity and your scientific integrity. On the other hand, you are looking to aid the cause of the people who have hired you. I think that's true of a lot of jobs that actually are for geographers. In the arena of task-oriented jobs, when one is doing work on environmental impacts, for example, I'm sure that there's an expectation that the person doing the statement will do all possible to help the employer in getting past the various regulatory systems. I want to make sure I say this very carefully. I'm not talking about success through devious means or through dishonesty, but simply that one makes a determined effort to make certain that the people proposing a project have a full understanding of the environmental implications of their project and what kinds of steps they need to take to correct potential impacts. If one is sloppy about that kind of work then they will likely be caught by the system and the regulations later on. So, the more thorough you are the better job you do for your employers. People sometimes misinterpret work that is done on impact statements or similar tasks as simply being compatible with the wishes of their employers. Usually, it's quite the opposite; if they are going to do a good job, they will become a devil's advocate.

Q: How do these people or firms know you are available for this type of work?

A: I don't know that they do. I've been fortunate to occasionally pick up employment of this type at times when I had a little freedom to do so. Obviously when you're an academic you can't do these kinds of consulting jobs unless you can do so without interfering with your normal university tasks. People have come to me, I'm certain, through word-of-mouth awareness. Some of the participatory community activities where mine didn't hurt; I've become fairly well known in Arizona. I turn down more than I take on, but I have been able to spin off some of the jobs to my current or former students.

Q: Are there fundamental differences between applied and basic research from your point of view?

A: This is another of those "yes and no" answers. I say no in the sense that there's certainly a great overlap in such things as the methodology. There may even be an overlap in subject matter depending upon the task. But the work really is different and that's the yes half of my answer. For example, you have a task-oriented goal and are working for someone who wants a particular kind of product to satisfy his need. Contract research often works this way. We often make the distinction in the university between a grant and a contract: a grant is for somewhat open-ended activities involving innovative research and scholarly activity. A contract very often has a beginning, middle, and an end to it. The money has been defined before the contract was ever signed. Anyone who takes on a contract knows what they have to deliver by a certain date—this is often true of applied research. The person or agency asking for an environmental impact statement isn't particularly interested in the theory of aerosols and particulates; they are interested in a performance that satisfies the regulations and EPA. That performance and the way it is established is prescribed in the regulations. Such an approach is not the way one would proceed if interested in basic research. The most interesting basic research, which would be of no use in the applied study, is the improvement of those air diffusion models because the presently
accepted ones are totally inadequate. I like to do applied research because I think geographers should be involved outside of academia and because the majority of the employment is student help, which gives them the opportunity to do real-world intern work under supervision before they graduate. I understand that your consulting work has uncovered a topic in basic research. Did your consulting work actually trigger the work in basic research?

A: Yes. There are two or three instances where my consulting work led me to begin initiating basic research. One example is the dust and highway accidents project in central Arizona. We became interested in some of the processes whereby Toll sediment transport occurred. We found there was very little done on the subject and we also developed a conceptual framework, some models to explain deflation and transport from natural and humanly-impacted areas. Several of us are in early phases of this work.

Another example, and the work is ongoing at the present time, had its origin in my role as a legal consultant. I've spent a good portion of the year for the last six years in the San Juan Mountains of Colorado. I've gone there primarily because it's the closest guaranteed snow-covered alpine environment in Arizona State University. I use it essentially as a field site for the training of students. We have become fairly well known in the local community there and for one reason or another when there was a major drainage in an alpine lake near Silverton, I was called in to do a study and be an expert witness in a fairly large trial in the Denver federal court district.

The work was required in the course of the preparation for the trial turned out to be absolutely fascinating. In fact, some of the work actually required doing basic research. This experience opened up many new questions relating to the glaciology and the geochronology of the San Juan Mountains district and also the entire Rocky Mountain area. It looked like the data we were pulling out of the sediments of this lake were leading us into some rather radically new interpretations of what happened during the recession and the major glaciation. Of course, we are pursuing that on our own as a basic research project and will be publishing results in about a year.

Q: I gather that much of your research is done as part of a graduate student team research?

A: Yes.

Q: I suppose physical geographers do that more than human geographers?

A: I suspect in certain areas of physical geography, yes. We have a whole set of techniques that require assistance. It takes two or three people to operate the equipment. But I'm not sure that's true across the board. My work in alpine areas, often under difficult conditions, requires several of us to do the work. There are different philosophies about this. Some very well-known physical geographer will never teach a university student or graduate student as a field assistant. He only wants very bright, eager, and strong high school seniors. The reason is that they never start to think it's their work and become jealous. After digging holes in the ground all summer, for example, or some other type of physical labor, some students think that somehow they are part of the creative force and they all want to become coauthors. This particular geographer has had some bad experiences in this way and so he avoids it by using high school students. My preference is to build the pyramid of students so they're all progressively getting more and more experience. In large projects, the undergraduates assist masters' candidates, who in turn help candidates on their Ph.D. research. I'm floating around out there, sometimes doing my own research but often providing some guidance and counsel. The risk, of course, is that a weak link can destroy the chain. I've been lucky to have worked with responsible and reliable student colleagues. I'm delighted to share my own research with others if they can bring something to bear on it. If the students are doing the research, I'm happy to let them do the whole show themselves and get full credit.

Q: In your experience, do you think there is any difference in how you would train students for basic versus applied research?

A: I don't think that generally there should be a great deal of difference in the curricula and programs devised for people going into either academic or applied. (I am eliminating the Ph.D. degree at this point, because I view that as a basic research degree in any event.) Students going into the applied world could be placed in a situation where they better understand the nature of the kinds of work environments in which they will be employed, I try to do this in a course I offer. The academic milieu has little resemblance to the reality of working in a planning office, a consulting firm, or the Bureau of Land Management. A lot of work involves joint research; you are doing portions of a task. You may be on a task a few weeks and then pulled off. There may be a lack of continuity. For this reason, I think there is a lot of frustration involved with the work that people do in the applied areas. They don't have as much control over a project as they would like, or they may have had no experience working with other people. I try to set up situations where they have to deal in problem solving in teams and I intentionally set up all kinds of frustrating obstacles. They hate it! I warn them at the beginning that they're going to be unhappy. Towards the end, they realize the benefit of the experience. Most of us don't like to be in a situation where we're not clearly directed and don't have the feeling that we're firmly under control—but that's the real world.

Q: Some academics look down their noses at applied research as being an inferior endeavor. Do you share this opinion?
A: No, I don't share that opinion. I think it's different and has to be viewed and interpreted in its own context. If it weren't for applied research, I sometimes wonder where our basic base would come from. A huge amount is produced in that area. I'd say the sad thing about applied research is that a very large proportion of it is in a fugitive form. Either it's confidential, or proprietary, or they say, or it's in some mimeo report that only sees its way into a few files. I often find when I encounter some of this material that, if only it could be broadened to cast to the larger community I think it would be very useful. People are probably not always appreciate that themselves. It's just a job; they're not worried about the location of the research cutting edge.

Q: There seems to be a difference of opinion whether physical geography should study physical phenomena alone or only in conjunction with mankind.

A: Since I play on both sides of that fence I don't see the need for the debate between the different elements of environment and we're looking at interacting processes. Now an ecologist would obviously say, "So do we!" and I would agree. Physical geographers and ecologists have very similar points of view. The inevitable fact, and this is certainly an old saw in geography, is that if it wasn't being done by physical geographers, it wouldn't be done. There is a great deal of the world that seems to be filled only by physical geographers; the same claim has been made in human geography.

Q: Do you have a philosophy of geography?

A: I have mixed feelings in reacting to the question. I think it's important to be able to express some philosophy of geography for purposes of persuasion and for purposes of discussion working with students. I think that perhaps my philosophy came to me intuitively in the way of my decision to enter the field. My philosophical position is tied up with the idea of environmental unity—the interdependence of the elements and processes of landscape. I would say that, more than the spatial emphasis or the temporal, it's the unity that is the hallmark of my geographical thinking. Conveniently, if you address environmental unity, you cannot leave humans out of the equation. That's the guts of geography—most of the elements and processes of environment are interrelated and interdependent and to alter one is to alter the total. And that's where I begin.

Q: There seems to be a renewed emphasis in landscape as a subject of inquiry in geography. Do you think this provides the possibility of collaboration between physical and human geographers?

A: I suppose you mean Landscape Magazine, the old Berkeley view? I'm not terribly facile on this particular topic. I think it's terrific that people are bringing different perspectives to view the landscape. The place where I see the easier amalgamation of physical and human geography is in the more practical areas—the problems that have to relate, for example, decision-making processes and environmental regulations to aspects of physical landscape and human-built landscapes. These are areas where one person can't possibly begin to cope with the whole topic. For example, the industrial geographer working with a geographical climatologist might make an ideal pairing to investigate industrial location questions in an area when the Clean Air Act and its Amendments may have as much to do with industrial location as anything else. I see these as kinds of easy marriages to make, and maybe it will be the applied geographers that make them.

Q: Do you think we threw the baby out with the bathwater when we rejected environmental determinism?

A: It's too bad that work ever occurred because people had attached themselves to terribly simplistic statements; it's easy to say this fifty or sixty years later, of course. It cost physical geography and I think it cost geography generally. A lot of topics were put in such a light that people were afraid to touch them for years and years. In climatology, the relationship of human behavior to climate became a nono. We know there are some aspects of how people behave and perform that have to do with the atmospheric environment—temperature, humidity, etc. We neglected a lot of that kind of research because we were so scared of Huntingtonian determinism. I think it's true that a lot of good research went elsewhere or didn't go anywhere because of this.

Q: Do you know of any collaborative work between a physical geographer and a human geographer?

A: I can't think of many in academic offhand. It's more likely to occur in applied geography or in some government agency. A few examples do, however, come to mind. I think of the work of Ron Johnston and John May on air pollution and residential location in New Zealand, the economic and biogeographical investigation of Rio de Orozaba by Tom Debry and John Nyström, and the combined Melanesian studies of Dick Bedford and Roger Mclean. More often, perhaps, the combinations occur outside of geography, such as Karl Butzer's work with anthropologists and archeologists, Waldo Thobler's intersection with geologists, Bill Wantz's collaboration with an astronomer and Brian Berry's contacts with engineers.
way down to the ocean. This has, in fact, reached disastrous pro-
portions in Nepal, Mexico, and many other areas, where the over-
utilization of the slopes is raising havoc with the whole ecosys-
tem. These are problems where the culture and environment must be
viewed together and I think terrific opportunities exist in this
area. Or take the energy issues in the American West. We have
energy, environment, water, and people all intermeshing and con-
verging in what, at the rate we're going, is going to be one of
the greatest land policy/land-use collisions of all time. It will
occur from the western slope of the Rockies all the way to the
Sierras and Cascades. We don't even understand the environmental
and social implications yet, but we ought to be trying to learn.

Phillip Muehrcke

Phillip Muehrcke looks like a smaller version of Clark Kent: a
pleasant, attractive, square-jawed man behind his glasses. His
voice has that soft, delightful accent of many Anglo-Canadians.
Actually, he was born and raised in the upper peninsula of Michi-
gan. Behind that mild exterior is a man of purpose and steady
resolve. Blessed with commercial book publishers, he pub-
lished a text on map interpretation himself. He backed his con-
viction with $5,000 of his own money; fortunately, sales have
been good. When he assumed the directorship of the cartographic
lab at the University of Wisconsin, he found it necessary to let
some personnel go in a painful shake-up.

He appears to be a highly organized individual; his writing
and lectures follow well thought-out outlines. He knows where he's
going and how to get there. His academic career has been
marked by fellowships, grants, and promotions. Like many capable
people he works hard but without a sense of strain. He mentions
that many undergraduate students tend to pick the subject in which
they do well but he didn't have that option. Left unsaid was the
reality that he did well in most subjects: originally his major
was accounting, then math, biology, and finally his increasing
focus of interest--geography.

Many cartographers are perceived--perhaps unfairly--to be
rather narrowly focused; concentrating on honing their technical
expertise at the expense of a more well-rounded range of interests.
Muehrcke is the opposite. He had only a few cartography courses
the rest were in geography or cognate areas. He took more than
the required number of courses and often audited others as well.
This wide-ranging orientation has continued after graduation. His
undergraduate math training has allowed him to consult a wide
spectrum of the literature from highly quantitative-model orient-
ated articles to humanistic studies.

His eclectic academic style was nourished by his professors
at Michigan, especially his advisor, Waldo Tobler, and John Nystu.
They encouraged him to see geography in almost everything in the
effort to bring fresh approaches to old problems and new imagin-
ation to the conventional wisdom. He stresses the fact that he is
a geographic cartographer, one who is constantly linking geography
with cartography. He is unhappy that many cartographers now ignore
the potential contribution of maps to their analysis, while some
cartographers maintain an independence of geography. He is less
concerned with making maps than exploring their meaning, extend-
ing their use, and reducing the anxiety of map readers.