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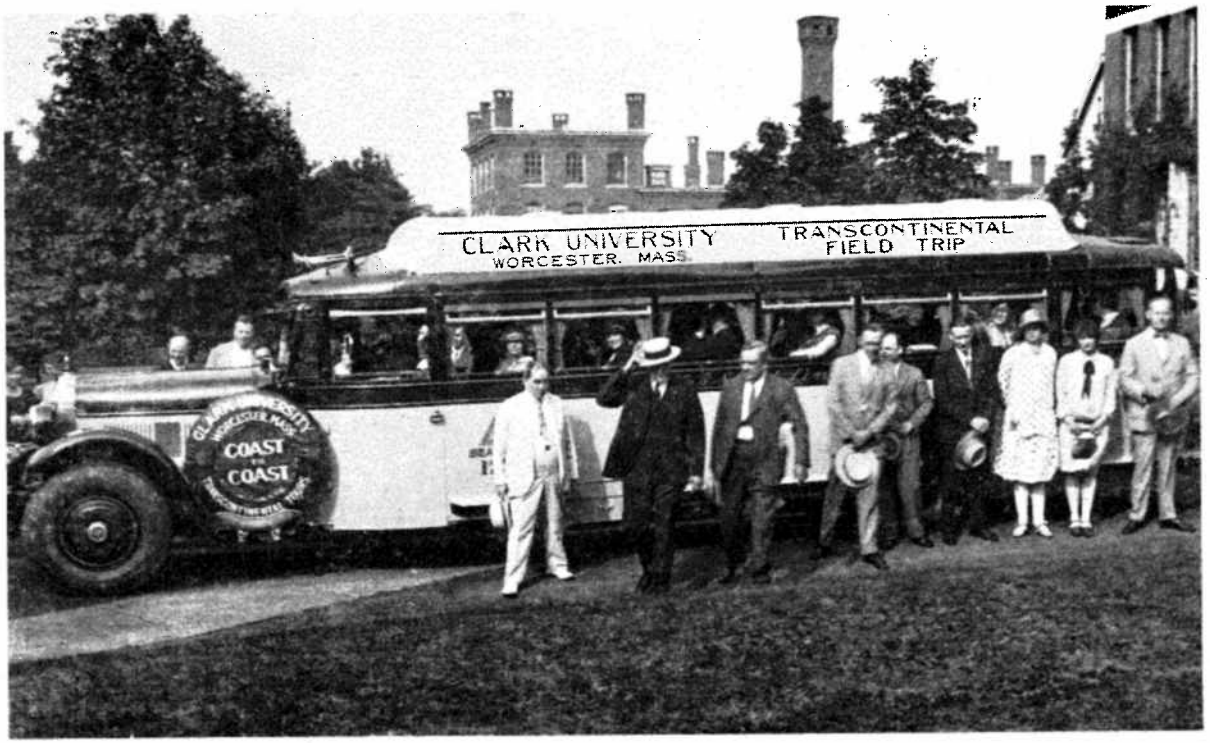

Clark University **Volume 50**

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VOLUME 50

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Editors' Note

Following forty-nine of its predecessors, this year's volume of the Monadnock marks a half century of service to the Graduate School of Geography. At the very least, this represents a stubborn persistence (often to the surprise of alumni re-established on our mailing list after many years) in keeping people in touch with each other. In more recent times, the Monadnock has additionally been the product of a continuous effort to keep alumni, and the geography community as a whole, appraised of activities and developments taking place in the Graduate School. In keeping with this goal, we are fortunate this year to be able to present the text of the annual Wallace W. Atwood Lecture, given by the distinguished founder and long-time editor of Landscape magazine, J. B. Jackson.

We have also included in this volume three thought-provoking papers by individuals currently active in the department. David Seamon's paper offers new perspectives on the man-environment relationship; Curt Rose's work explores the significance of philosophical concept of time to geographical thinking; and Nurit Kliot's review of the recent literature in Political Geography highlights the latest developments in that field. We feel that these papers represent the type of critical, innovative thinking that remains fundamental across the spectrum of work in the Graduate School of Geography today.

We would like to extend special thanks to the Typing Pool of Clark for patiently typing the text, Larry Delson for taking the group photograph, and most importantly, the alumni of the Graduate School, whose generous support has helped make possible the continuous publication of the Monadnock for these past fifty years.

Incidentally, the cover depicts another long-standing tradition in the Geography Department, the transcontinental field excursion, represented in the seventies by the Know America Project (see Monadnock 49 (1975), pp. 99-100).

Michael Steinitz
Vernon Domingo

Director's Message

This is a year for soul-searching in graduate education. Issues of Ph.D. glut, of applied versus basic science, of falling levels of public support for graduate training, of the narrowness of the disciplines -- are issues that evoke continuing debate and critical reports. From our vantage point in the Graduate School of Geography, they seem a bit remote. Our professional lives followed the customary course this past year: graduate students and faculty continued to study, research, teach and interact with the community with verve and vigor; new students of the highest calibre continue to seek admission; innovations in courses and programs continue to characterize our day-to-day lives.

I have no doubt that our complacency will soon be shaken, for what affects graduate education in general, and our profession in particular, will inevitably affect us. I have no easy prescriptions for facing the uncertain future. We are being cautious in certain ways: reduced numbers of new graduate students; search for post-doctoral support opportunities; shouldering of new teaching responsibilities within the college to strengthen our faculty and graduate student support base; and increasing systematization of our job placement efforts. In the last analysis, however, the best way for a graduate department to cope with the future is to nurture a human resource base that has the intelligence, skills, sensitivity, and courage to strike out in new directions through an iterative process. We have such a base. The base is strong enough to withstand shocks, be they short-term, medium-term or long-term in duration. And it is sufficiently varied to provide the energy needed to forge new directions. What gives special distinction to this Clark base is its collective nature. Faculty and graduate students alike have stepped into the breach of teaching and research needed to keep the system alive and well.

There will be some changes next year. We are bereaved at the passing of Dr. Van, who was Mr. Clark Geography for so many years. We also bid fond farewells to Irving Schwartz who, as Adjunct in our School, gave new dimensions to Geography and Its Teaching; to Ruth Anderson Rowles, who has so ably directed our Cartography Laboratory and now moves with her husband, Graham, to the University of West Virginia; to Asher Schick, who spent his sabbatical from the Hebrew University with us; and to Solveig Martensson, from Lund, who was with us for half of the year. We will welcome back from sabbatical leaves Anne Buttimer and Gerry Karaska, but miss a number of colleagues scheduled to go on leave for all or part of the coming year: Bob Kates, Larry Lewis, Dick Peet and Steve Feldman. We will have the company of a number of visiting faculty members, not so much to "fill in", as to bring new ideas and spirit to the School. In all, this was a year of deepening of various research and teaching experiences. We expect next year to be equally rewarding.

Saul B. Cohen

The Wallace W. Atwood Lecture

J.B. Jackson: A Forward

by MARTYN J. BOWDEN

Twenty years ago to the month a bright-eyed and bushy tailed undergraduate sophomore walked through the turnstile into the geography periodicals room at University College London. The object was the usual scanning for newly arrived journals, to be one up on fellow undergraduates. My eyes roved the sober and somber - dark blue, grey, brown - single color - periodicals familiar to all of you - and alighted on something new. The new journal had a multi-colored, attractive cover that invited one to explore further. The specific cover I still remember - the experience was so memorable. Thus was Landscape brought to my attention.

All that glisters isn't gold and at first I was appropriately wary that this seemingly "flashy" magazine (that's the word I would have used) was not another National Geographic. First appearances supported suspicions: the articles were short, four or five pages, (weren't all articles supposed to be at least ten pages in length?); there were no footnotes; there were photographs, telling sketches and intricate drawings, and sin upon sin, in a journal that had the subtitle "Magazine of Human Geography", there was not one article by a "professional geographer" (these are the ones with Ph.D.'s). At that time the authors were not identified and so I went to the proper places to look these authors up, and lo and behold, none of them appeared in the right places.

Landscape was obviously from the underground. Furthermore it was edited by a maverick, J.B. Jackson, who thought that the ordinary house was central to landscape concerns and who wrote articles about front yards, tourist towns, and other directed houses. To him "tourists" were people and "the abstract world of the hotrodder" and "the stranger's path" in the city were worthy of serious study. Landscape's editor, a mystery man and non-academic seemingly came from nowhere to reawaken in an increasingly urban people an appreciation of rural America; to show Americans in Robert Frost's words, "the need of being versed in country things". The message as in so much of J.B. Jackson's writings was jargon-free, succinctly stated, but with a flair and driving style that captivated all who read the journal.

Beginning in 1951 as Landscape: Human Geography of the Southwest with 20 subscribers the journal quickly attracted a devoted following. Within a year the focus shifted to the nation, and within four years, to the world.

Seemingly unaware of any human geographers in the U.S., the editor (J.B. Jackson) felt the need to tell his readers what human geography meant, and this he did in excerpts translated by himself

from the works of French humanistic geographers - notably Le Lannour, Sorre, and Deffontaines. From Le Lannou he took the definition of human geography that appeared in the journal's subtitle: "the study of man the inhabitant". In 1954 this subtitle definition was changed to a Vidalian one: "the study of the earth's surface as modified by man the inhabitant"

By the following year such definitions were unnecessary. At University College London, graduates, undergraduates and faculty were trying to get their hands on this unorthodox package. In America, the Berkeley School of Carl O. Sauer and such friends of Sauer as the botanist Edgar Anderson and Lewis Mumford had discovered Landscape and provided contributors to each issue. In every issue we narrow specialists who had read only "professional geographers" before, were introduced to concise summaries of the ideas of notable philosophers, artists, folklorists, landscape architects, planners, literary historians, novelists, psychologists and planners, and in their own words. It was all so fresh and invigorating. With such a following the editor was encouraged to change his focus after only five years. The emphasis shifted from making people aware of the countryside to any active focussing upon the identification of landscape problems and to critiques of environmental policy. To this Jackson brought a well developed sense of history so well revealed in his recent book, American Space: The Centennial Years, a poetic vision and symbolism (epitomized in his Landscapes: Selected Readings of J.B. Jackson edited by Ervin Zube) and a finely tuned sense of American place.

There is a rising consciousness of landscape in America, as witnessed by a succession of books of readings, conferences, slim volumes by one author, and the number of grants given by major agencies and foundations in recent years. This trend follows an earlier trend in England which began twenty-five, maybe thirty, years ago. The English interest shows no sign of abating; the English audience becomes more discriminating and much larger than Cornish, Sharp, Hoskins, and H.C. Darby could ever have conceived. The same is happening in the U.S. There seems to be a growing market for American landscape studies in the foreseeable future. No one has done more than J.B. Jackson and his magazine Landscape to inspire this. The unique thing about J.B. Jackson -- compared to all others in the geography and landscape architecture fields -- is that he has attempted to understand the American landscape from the vantage point of American roots and values. He is no apologist and uses no European standards to establish the levels of taste, acceptable forms and norms found in America. Jackson's viewpoint, as landscape consciousness spreads beyond the elite, will reap the whirlwind of the next twenty years.

J.B. Jackson's achievement is remarkable. An unknown, with seemingly no contacts, he financed, published, and edited his own journal, promoted a dialogue among all the disciplines concerned with landscape and man's use of the environment. For geographers, he replaced the old sterile social-science definition of landscape

as something little more than region, with a new multi-dimensional humanized and sensory landscape focussed on the genius loci; he encouraged geographers and others to put individual people living in homes back into their studies. In so doing, he made Landscape an early mouthpiece for the new interdisciplinary field of environmental perception before "the cognitive reformation" of the 1960's.

As people began to realize in the 60's that Landscape's editor had a flair for lecturing as well, "Brink", as he is known to close friends, began to spend more and more time away from his beloved Santa Fe, New Mexico at campuses east and west. He was a frequent visitor to Berkeley in the early sixties. There was the greatest concentration of his friends and Landscape collaborators. It was his second home, and it was fitting that the relationship was formalized in 1967 with his appointment as adjunct professor in landscape architecture, lecturing in the spring term before large classes. It was to Berkeley that he moved Landscape magazine and it was to a Berkeley-based group that he handed over the editorship in the following year. To this spring appointment on the West Coast was added in 1969 a fall appointment on the East Coast as lecturer in landscape architecture in his alma mater, - Harvard (where he had received his B.A. in 1932). He now spends four months in Berkeley, four at Cambridge, and only four in New Mexico: the just reward perhaps for shaking us out of our complacency in the 1950's with a journal that is so much like the man, small but packed with dynamite.

We honor today the memory of Wallace W. Atwood, who like B.J. Jackson is an Easterner who became fascinated with and studied western landscapes, in Atwood's case the Rocky Mountains. It is an honor indeed to introduce Professor J.B. Jackson who will address us on a topic that would have greatly interested Atwood, "The Landscape Appearance".

The Landscape Appearance

by JOHN BRINKERHOFF JACKSON

For the past several years I have been teaching a course on the history of the American landscape. The history starts with the arrival of English settlers in the seventeenth century. Each year I grow impatient to have done with the Colonial period and to move on to the time of the Revolution. This is because I can then talk about a favorite topic of mine: the Grid system introduced by the National Land Survey of 1785.

Not everyone shares my enthusiasm. I have not persuaded many students of the beauty and significance of the American Grid. For that reason I dwell on it longer than is always wise. Even now I feel an urge to speak at length in its favor and to enumerate its virtues. In my own defense I may say that I never fail to list the advantages and disadvantages of the Grid system that Dan Stanislavski called to our attention many years ago. These are duly quoted back to me in almost every examination paper. I have to be content with knowing that students are at least aware of the grid's existence. Previously few of them had heard of it, much less seen it, though they might have flown over it many times.

I cannot help ending my annual discussion of the grid system by adding a quality which Stanislawski did not include in his list. The quality I mention is this: the American grid was the last and most grandiose attempt of the Classic European tradition to create a spatial order in harmony with a philosophical order. It was the last attempt of our civilization to define men in terms of the space they owned and occupied. And it failed.

We are all familiar with the reasoning: to organize space in a series of equal squares or rectangles is one way -- and at the time it seemed the best way -- to create a social order of men who were -- potentially at least -- all equal. It had been tried before, though never on such a scale. So why should it have not been tried again in a new land and with a new society?

A tradition, at least as old as Greece in the sixth century B.C., held that we cannot be full-fledged citizens, equal and interchangeable in responsibilities, unless we own equal shares of land. Jean Paul Vernant, in his book, Mythe et Pensée Chez les Grecs, describes how the Athenian tyrant Cleisthenes introduced what was termed an isonomic order into the layout of the Greek city: the grid; and how at the same time he sought to substitute a decimal system for the duodecimal system which had hitherto prevailed in the Greek calendar and in Greek coinage. But basic to that reform was the ancient belief that we could not be accounted free members of society unless we owned land, derived our living from it, lived on it, and finally bequeathed it to our children.

Our name, our location, our status, our very identity was supposed to derive from this relationship to a particular fragment of space, no matter how small or poor. And the space, the land in turn acquired its unique identity from our presence. This is what was once meant by visibility. "Property makes a man visible and accessible," the philosopher Ernest Hocking wrote many years ago. "I cannot see a man's mind or character. But when I see what he has chosen and what he does with it, I know what he likes, and quite a good deal about his principles . . . Whatever a man completely owns, whether it be a whole farm or but a single tool or animal, it is that bit of property which most completely reflects the kind of man that he is."

It was this reasoning that inspired the Founding Fathers and in particular Thomas Jefferson, often called the author of the Grid. No doubt it also inspired many of the first settlers in the new rectangular landscape beyond the Ohio, in the early years of the Republic: the ownership of land was not simply an economic necessity, it was a social, philosophical necessity: land conferred visibility and a fixed identity which misfortune could not alter. We belonged in a special place, and the place belonged to us forever.

Perhaps we are dealing with a fundamental human trait, as strong now as it ever was. I think it is more likely an aspect of a religious conviction. As such it is susceptible to change. In any case the belief that space confers identity is a very ancient one. Martin Nilsson, the Swedish philosopher, remarks in his book on Greek Piety that "we [meaning the modern American or European] make a spot holy by putting a sanctuary there; but in Antiquity the holiness belonged to the place itself, and a sanctuary was erected there because the spot was holy. Zeus was surnamed after the mountains about whose summit he gathered his clouds." Mircea Eliade, as we all know, has examined in detail the widespread traditional belief that certain spaces are inherently sacred and others profane. It is a belief which strongly affects the organization of the cultural landscape. A sacred space, whether grove or mountain or spring, becomes the focus of settlement and produces a community and a ritual based on territoriality -- a space occupied by a well defined group. But more than that, it establishes a hierarchy, a scale of values among the surrounding spaces. The nearer a space is to the sacred spot the more desirable it becomes. Space thus tends to develop a centripetal pattern; in the design of the Cosmos no less than in the landscape. Both are subject to the same laws. And it follows, I think, that this kind of spatial organization eventually affects the social organization. It too becomes hierarchical and focussed upon the symbol of authority: the space or person at the center. Progress toward the sacred, or toward power, whether we understand progress to mean motion or development, assumes the form of an orderly, almost ceremonial passing through one space after another -- spaces of increasing sanctity or prestige, until at last the goal is reached.

Finally in this view of the world time itself is organized to remind us of the importance of space. The day, the year, the lifespan are measured in terms of the recurring passage of heavenly bodies from one preordained space to another. The calendar marks the location of stars and planets at certain seasons. It determines the succession of rites and celebrations. The phrase, "to be in Seventh Heaven," once had such a significance: the point where spatial and temporal goals coincided to produce something like complete bliss. There again the emphasis is more on place than on the moment.

The point that I wish to make is that certain societies and certain religions set great store on space. These are usually what we would call conservative societies, determined not only to preserve a social order which they conceive of as divinely inspired, but also to preserve a definition of man as an occupant of a clearly defined space. The overriding concern in religion as well as in everyday life is status; the question to which everyone seeks an answer is "where?"

So in Classical times the landscape was perceived in very different terms from the way it is now. It was perceived in terms of human occupancy; it was a mosaic of clearly defined human spaces: fields, farms, domains, sovereignties. Each of these was the spatial counterpart or image of its human tenant. And what could be more fitting than to ascribe human characteristics to these landscapes: to speak of a smiling landscape or friendly landscape or an innocent landscape or -- on the contrary -- to speak of landscapes which are forbidding or lifeless? Just as we discover a man in the moon, the humanist tradition discovered human traits in the face of the earth: wherever men looked they saw their own reflection. The checkerboard landscape of the early United States saw men like equal, interchangeable checkers, each occupying his own individual square -- ready to move on to another, similar square and, if fortunate, reaching the ultimate square, where he received his reward.

But as we know, the promise of the grid, the visible confirmation of the new egalitarian social order, was not fulfilled. And we should ask ourselves, why? One explanation of the decline of visibility, which we need not repeat, was the widespread speculation in land. Men owned land which they did not occupy and had no intention of occupying. Men occupied land which they exploited but had no intention of owning. Other men worked land and lived on land which belonged to others, and the classic concept of land as the source of social identity could not long withstand this destruction of the old relationship. It is one of the ironies of our history that the grid was almost totally invisible in the early American landscape beyond the Ohio -- except, of course, in the grid layout of the towns and villages.

The prevalence of forest in the first decades seems to have made for meandering roads and irregular fence lines, and a landscape temporarily not unlike the landscape of the older East. It was for long a landscape devoid of straight lines and right angles -- far

from the rational landscape Jefferson had had in mind. One searches in vain in the early descriptions of the Midwest for any evidence of the Grid. It was there in deeds and titles and township boundaries; but no one saw it. It was more than a century later, with the coming of commercial aviation, that Americans first perceived the grid landscape.

But it was really neither land speculation nor the prevalence of trees which obscured and eventually obliterated the traditional spatial order. That obliteration had already started in the mid-eighteenth century. The movement of landscape appreciation that we associate with early Romanticism, the movement which eventually led to the discovery of the unspoiled beauties of forest and mountain, can also be seen as a rejection of and disillusionment with the definition of man as a social and political animal and (in consequence) the perception of the landscape in social and political terms. Man defined in terms of action and speech, defined in terms of social visibility, became suspect. Beneath the appearance of the citizen-landholder was concealed another entity to be defined in terms of sentiment and emotion. It was what lay hidden under the artificial surface that was real. And therefore what lay beneath the carefully delineated pattern of fields and principalities, beneath the pattern of political spaces, was the real landscape. The noble savage, now reduced to a figure of fun, was the real identity. The natural landscape in consequence, hidden beneath the man-made surface, was the real landscape. For I believe this to be true. The manner in which we perceive the landscape and interpret it is simply a variation of the manner in which we perceive man and define his essence. Whatever we must value in the world are those qualities which we most value in man. The reality of creation escapes our grasp; and appearances, no matter how much we study and try to understand them, prove to be nothing more, and can be nothing more, than reflections of ourselves. And to this extent we will always be children of this world, of this planet.

So the chronicle of nineteenth century attitudes toward the environment is essentially the chronicle of a persistent attempt to get below the surface, to outwit the illusion of man as a political animal and the illusion of the world as his god-given property or space. The manner in which the pioneer Midwestern landscape swallowed up the grid, leaving scarcely a trace behind, was symbolic of the manner in which the nineteenth century artist and poet reduced the cultural landscape to composition of ruins and wilderness. Somewhere beneath the man-made surface material, reality was eventually to be found; somewhere beneath the artificialities of class and political allegiance the human reality lay waiting to be discovered. And in this sense the study of geology was simply another version of the study of psychology -- both of them probing what lay beneath the surface. And the definition of natural regions, so exciting an undertaking among geographers of half a century ago, finds its parallel in the efforts of sociologists to redefine the composition of society. What we saw both in the landscape and in other people was merely disguise. Truth was to be found far underneath, in the hidden recesses of invisible nature.

The endeavor is a familiar chapter in our history; it led not only to the development of a new kind of geography but a new psychoanalytical approach to man -- in both of which undertakings Clark University has played a leading role. And what this probing revealed is as momentous as that rejection, two centuries ago, of the surface as the true reality. What we discovered was nothing solid or permanent on which to build a new vision of the world. What we discovered is movement; incessant movement and change which we attempted to systematize as history. So the most urgent question we can now ask is no longer where? but when? Space does not define us; time, the event, defines us. Hannah Arendt speaks of the concept of history becoming dominant in modern philosophy, and of how, in the nineteenth century, the natural sciences developed "the sciences of geology or the history of the earth, biology or the history of life, anthropology or the history of human life, and generally, natural history . . . In the place of the concept of Being we now find the concept of process. Natural science," she adds, "deals only with occurrences, happenings or events, but not with things. Apart from happenings there is nothing."

If we have learned that beneath the landscape -- and in the space above it -- there is nothing but process and change, does this mean that we have also learned to see ourselves as merely the product of processes and events? Popular psychology assures us that our existence is the playing of roles, an unending process of self-defining. But those of us who think in geographical terms, who think in terms of the earth and our relation to it, are likely to be uneasy with such a statement. If we have rejected the political or social function of space, we have not necessarily rejected space as an element in our identity. If we have accepted the concept of the landscape as a ceaseless process, this does not mean that we are incapable of experiencing it. It is by contact with space that we have always learned to know more about ourselves. Are we to suppose that this kind of insight is no longer within our reach, and that there is no alternative to the classic definition and a definition based on random events?

I think the landscape now evolving around us suggests something of an answer. There is scarcely a fragment of land, a structure, a relationship within the man-made environment that is not being transformed by what is a totally new experience of space, a new use of space; one based on mobility and speed; specifically on the independent, individually controlled mobility afforded by modern technology: by the automobile and the airplane -- as well as a variety of auxiliary means. The landscape is transformed, our experience of the landscape is transformed; most important of all, we ourselves are transformed as new emotions, new responses are revealed.

It is hardly necessary to say how novel this experience still is, and how little understood. In the nineteenth century and in fact well into the present century speed was no novel sensation, but like all the mobility and process of that age it was predictable and determined by a timetable; structured and linear. This new

mobility, significantly enough, has become an essential element in our sports and search for freedom -- in skiing and surfing and hang-gliding, all-terrain travel, and exploration; and also essential to many kinds of work. The farm tractor moves freely across the countryside. Heavy construction equipment does the same.

In time I think we will see that the greatest consequence of this new mobility is a changed perception of the environment, a new psychological dependence on the landscape. We are all aware of how the automobile has altered our notions of distance and time. We are aware of how, in that sense alone, it had changed our experience of the landscape, our way of seeing it; and even more significant is the experience of flying.

Beginning in the late 20's, when commercial flying became general, the average American suddenly perceived the world from a totally new perspective. It would be hard to exaggerate the consequences of this revelation, or of the developments, technological and psychological, which followed from it. All at once we were able to see the landscape -- and ultimately the whole globe -- as something alien and yet belonging to us . a distinct object marked by history and nature. We learned to see the surface and in the same glance to see below the surface: appearance and process as aspects of the same entity. When we fly at thousands of feet above the marvelous pattern of rectangles and squares, stretching for an infinite distance to the very curvature of the horizon, we see the history of the world and the landscape as an instantaneous event: the landscape Jefferson dreamt about is beneath us and so is the landscape of the present and of the remote geological past. They are all visible, and all part of our visibility.

To see the world objectively, and to reconcile all its various aspects and see its essential oneness is to have a new experience of space. And if we have a new relation to space, whether outer space or the space of a landscape, then I believe it means that we are on the way to seeing ourselves in a new way, learning to reconcile the visible and invisible aspects of our nature, just as we are learning to reconcile political space and cosmic space.

Extending the Man-Environment Relationship: Wordsworth and Goethe's Experience of the Natural World[1]

by DAVID SEAMON

> What dwelling shall receive me? in what vale
> Shall be my harbour? underneath what grove
> Shall I take up my home? and what clear stream
> Shall with its murmur lull me into rest?
> The earth is all before me. With a heart
> Joyous, nor scared at its own liberty,
> I look about.
>
> William Wordsworth, The Prelude.[2]

I. Introduction

As Theodore Roszak, Paul Shepard, and other modern-day commentators on man-in-the-environment have suggested, nature today is usually thought of in terms of either expendable resources or tantalizing scenery.[3] For many contemporary Americans, the natural environment is either an inexhaustable source of raw materials, or a switch-on switch-off entertainment like television that amuses or overwhelms. Unlike our ancestors who even in the recent past lived closely with nature and saw it feed, clothe, and shelter them, we modern men have learned to simulate nature's works and predict and control many of its forces. Through our technology and science, we have fabricated about ourselves a thick artificial environment that insulates and even severs us from nature. On the one hand, man has sought to conquer nature, using it as a slave or servant; on the other hand, he has often made nature a novelty -- a prepackaged place such as recreational area or national park -- where the American public is invited to repair in the hundreds of thousands and sometimes the millions.[4]

Because of our exceptional technological powers to manipulate, duplicate, enhance, and even dispense with nature, we often lose sight of the fact that we are not really separate from nature, but a miniscule cog in its great wheel of life:[5]

> We forget that nature is, quite simply, the universal continuum, ourselves inextricably included; it is that which mothered us into existence, which will outsurvive us, and from what we have learned (if we still remember our lesson) our destiny. It is the mirror of our identity. Any cultural goods we produce which sunder themselves from this traditional living connection with the non-human, any thinking we do which isolates itself from, or pits itself against the natural environment is -- strictly speaking -- a delusion, and a very sick one.

By believing too completely that we are free existential beings destined to become individually what we each wish to become, we too often forget that we are also ecological beings comprising but a small part of a great and delicate earth ecosystem. Recognizing man's considerable indifference to his ecological situation, the influential American conservationist Aldo Leopold pointed out over two decades ago that the man-environment situation could only improve if individuals purified their attitude towards nature and fostered in themselves a stronger love of earth.[6] In his classic 1949 essay "Land Ethic," he argued that modern man must create in himself an ecological consciousness which reflects "a conviction of individual responsibility for the health of the land."[7]

Yet though the man-nature situation has deteriorated drastically since Leopold wrote, few students of the environment have sought to discover a practical method for promoting the ecological consciousness that Leopold advocated. By asking if nature can be known in some other, more authentic way than as resource or scenery, the present essay seeks to suggest one possible approach for fostering a greater ecological consciousness. More precisely, it examines the encounter with nature as known by two exceptional poets and sensitive students of the natural environment -- William Wordsworth (1770-1850) and Johann Wolfgang von Goethe (1749-1832) -- and asks the significance of their experience in relation to present-day thought on the man-environment relationship.

For both Wordsworth and Goethe, the natural world was something much more than the reduced presence it has so often become in our own time. Both of these exceptional men realized the profound and inseparable connections among man, nature, its elements and processes -- not only in terms of physical linkages, but spiritual ties as well. Just as importantly, Wordsworth and Goethe understood these intimate bonds not intellectually -- as the modern-day ecologist, biologist, or geographer might -- but experientially, through a heightened emotional contact with the simple, everyday things of the natural world -- such as plants, rocks, colors, and ordinary landscapes. As Wordsworth explains this way of knowing nature in his long autobiographical poem The Prelude:[8]

> To every natural form, rock, fruit, or flower,
> Even the loose stones that cover the highway,
> I gave a moral life: I saw them feel,
> Or linked them to some feeling: The great mass
> Lay bedded in a quickening soul, and all
> That I beheld respired with inward meaning.

And as Goethe echoes this experience:[9]

Joyously, so long ago,
My eager mind did strive
To study and Discover
Nature in her works alive:
She the everlasting Oneness
In the manyness divided.
Big minuteness, tiny bigness,
All according to its kind,
Ever changing, ever constant
Near and far, far and near,
Shaping and reshaping...
Why but to wonder am I here!

In some special way, Wordsworth and Goethe were able to discover to the very depths of their beings that the seeming diversity of the natural world is reflective at a deeper level of a great universal wholeness infusing all things. This paper examines the nature of this unifying sensibility and considers its potential significance to geography and other disciplines which encompass the man-environment relationship in their research endeavors.[10]

II. William Wordsworth: Describing the Encounter

Growing up in an England that was experiencing the ordeals of an Industrial Revolution and a shifting social structure, William Wordsworth was a major figure in the "Romantic Movement" which heavily influenced English intellectual circles at the start of the Nineteenth Century.[11] Reacting against the writers of the preceding Augustan Age, who had glorified man's intellectual powers at the expense of his emotions, Wordsworth and such contemporaries as Coleridge, Shelley, and Keats lamented and criticized the limits of human reason, and turned instead to the powers of intuition, spontaneity, and feelings.

For the Romantics, nature was crucially important because it was an inspiration and teacher. To understand nature, the Romantics used themselves as a kind of sensitive screen that carefully registered the natural world's physical and spiritual vibrations, which in turn purified the experiencer and brought him more in contact with both nature and himself. Of all the English Romantic writers, Wordsworth was perhaps the most sensitive to nature, experiencing at special moments an intense spiritual communion with the natural world. In this encounter, Wordsworth does not analyze or contrive, but quietly "attends and converses."[12] To better understand this special way of understanding nature, let us briefly consider Wordsworth's exceptional poem, "Lines Composed a Few Miles Above Tintern Abbey on Revisiting the Banks of the Wye During a Tour, July 13, 1798" -- more commonly known as "Tintern Abbey."

Among poems of moderate length, "Tintern Abbey" has been called by one critic, "the supreme record of the impact of landscape upon the inner-most recesses of the human mind."[13] Written on Wordworth's second walking visit to the beautiful Wye Valley region

of England, the poem opens with a concise description of the natural setting Wordsworth sees before him; on first reading, the sketch seems rather matter-of-fact:[14]

Five years have passed; five summers, with the
length
Of five long winters! and again I hear
These waters, rolling from their mountain-springs
With a soft inland murmur. Once again
Do I behold these steep and lofty cliffs,
That on a wild secluded scene impress
Thoughts of more deep seclusion; and connect
The landscape with the quiet of the sky.
The day is come when I again repose
Here, under this dark sycamore, and view
These plots of cottage ground, these orchard tufts,
Which at this season, with their unripe fruits,
Are clad in one green hue, and lose themselves
'Mid groves and copses. Once again I see
These hedgerows, hardly hedgerows, little lines
Of sportive wood run wild; these pastoral farms,
Green to the very door; and wreaths of smoke
Sent up, in silence, from among the trees!

At first glance, these opening lines of "Tintern Abbey" suggest a conventional picturesque approach to the landscape that Wordsworth views: in the background are the high cliffs; in the middleground, the cottage plots, orchards, and hedges that run into the forests beyond; in the foreground, the nearby sycamore tree which seems to frame the view in a proper picturesque manner. Yet on closer scrutiny, this opening scene indicates that the observer has begun to feel an inner response to the scene before him. The outside "waters, rolling from their mountain-springs" suggest a corresponding flow of images and feelings in the viewer, while the cliffs impress "thoughts of a more deep seclusion" on "a wild and secluded scene." Furthermore, Wordsworth's picture projects a kind of organic wholeness that consists not only of the scene's natural elements, but man's artifacts as well. The "steep and lofty cliffs" connect "the landscape with the quiet of the sky," suggesting the mergence of earth and heavens. Man-made cottage plots and orchards lose themselves in the forests; grass grows up to the very doors of the farmer's cottages; the smoke from men's houses slides slowly upwards, and diffuses in the trees and sky. Unlike the picturesque poet who would exhaustively articulate and sometimes modify the scene before him, Wordsworth has carefully chosen pictorial details that subtly begin to indicate man's bond with a unified nature.[15] Even in these opening lines, Wordsworth has given important inner significance to the outer scene.

In the poem's second paragraph, Wordsworth moves from the physical situation and describes in more detail the moral and spiritual impact of the landscape. First, he explains that in "lonely rooms, and 'mid the din of town and cities" the memories of land-

scapes like the Wye River have relieved his mind, providing "tranquil restoration." He also suggests that memories of nature may predispose man to good actions: they may have "no trivial influence" on "His little, nameless, unremembered acts of kindness and of love." Thirdly, and most important for our present purposes, Wordsworth explains that often these recollections have fostered higher perceptions that can see "into the life of things":

> ...nor less, I trust,
> To them I have owed another gift,
> Of aspect more sublime; that blessed mood,
> In which the burthen of the mystery,
> In which the heavy and the weary weight
> Of all this unintelligible world
> Is lightened--that serene and blessed mood,
> In which the affections gently lead us on--
> Until, the breath of this corporeal frame
> And even the motion of our human blood
> Almost suspended, we are laid asleep
> In body, and become a living soul:
> While with an eye made quiet by the power
> Of harmony, and the deep power of joy,
> We see into the life of things.

And now, in the present moment, Wordsworth explains, the past memories and "the sense of present pleasure" share themselves again -- not in the way he knew this place five years ago when he eagerly viewed the landscape like any other picturesque traveller might ("Their colours and their forms, were then to me/An appetite; a feeling and a love,/That had no need of a remoter charm"), but as a newly discovered tranquility that pacifies and reveals a sense of pervasive spirit deeply interpenetrating both Wordsworth's own self and the world around him. The unity of the external landscape portrayed in the poem's opening lines is now reflected in Wordsworth's inner state:

> ...I have felt
> A presence that disturbs me with the joy
> Of elevated thoughts; a sense sublime
> Of something far more deeply interfused,
> Whose dwelling is the light of setting suns,
> And the round ocean and the living air,
> And the blue sky, and in the mind of man:
> A motion and a spirit, that impels
> All thinking things, all objects of all thought,
> And rolls through all things.

In the poem's final section, Wordsworth recognizes his past way of experiencing nature in the present situation of his younger sister Dorothy, who is with him by the river. Though he can no longer know "the wild ecstasies" that she can still experience, he does not regret his own change, but projects his own present into Dorothy's future, speaking a prayer that emphasizes nature's strong

and good effects on man:

> ...and this prayer I make,
> Knowing that Nature never did betray
> The heart that loved her; 'tis her privilege,
> Through all the years of this our life, to lead
> From joy to joy: for she can so inform
> The mind that is within us, so impress
> With quietness and beauty, and so feed
> With lofty thoughts, that neither evil tongues,
> Rash judgments, nor the sneers of selfish men,
> Nor greetings where no kindness is, nor all
> The dreary intercourse of daily life,
> Shall e'er prevail against us, or disturb
> Our cheerful faith, that all which we behold
> Is full of blessings.

In "Tintern Abbey," then, Wordsworth sensitively describes a delicate correspondence between inner situation and outer environment. Most significantly for our purposes here, he skillfully portrays a special moment in which his experience of the physical environment suddenly expands and immerses him in the spiritual oneness of a unified nature. As he explains, he has known a force that floods his entire presence with "a something more deeply interfused" that dwells in all things everywhere -- in the sun, ocean, blue sky -- and most importantly -- "in the mind of man." With a proper receptivity, Wordsworth suggests, man may discover this presence all around and in himself. Just as most of us today accept -- some hesitantly -- that all parts of the natural world are integrally linked into variously-scaled, physical ecosystems, so Wordsworth suggests that beyond these material ties is a higher joining that infuses all earth being and all earth things -- a kind of "spiritual ecology," one might call it.

Having briefly considered the nature of Wordworth's encounter with the natural world as "Tintern Abbey" accurately reflects it, we must now ask ourselves if Wordsworth provides any signposts to guide other individuals toward this same experience. Should we study nature as a naturalist? Do we need to spend much time out in nature? Will a kind of spiritual meditation help evoke this encounter? In short, does Wordsworth suggest any kind of clues or procedures that might help the uninitiated discover about nature what Wordsworth already knows?

1. <u>The importance of "unassuming things</u>." Havens explains that in his encounter with nature, Wordsworth looked for universal things:[16]

> He sought the one behind the many, the real behind the appearance, the abiding behind the flux, the eternal behind the transitory, the changeless behind the mutable, the perfect behind the incomplete.

In seeking this pattern, Wordsworth went to the simple and abiding forms of nature -- to the "unassuming things," as he called them.[17] Wordsworth took great pleasure in viewing the ordinary forms of nature -- "rock, fruit, or flowers -- Even the loose stones that cover the highway" -- or simple scenes, like the attractive Wye riverscape, or the well-known field of daffodils that filled Wordsworth's heart with pleasure in his popular poem, "I Wandered Lonely as a Cloud."[18] For Wordsworth, the spiritual power of nature's whole manifests itself in the smallest of parts. Here, then, is the first clue Wordsworth provides for others' discovery of the encounter he knows: learn to respect nature's simple, everyday things. Through a humility and love for them, we may gain a deeper understanding for all of nature.[19]

2. The importance of emotional contact with the natural world. In emphasizing throughout his poetry the role of the emotions in his understanding of nature, Wordsworth points to a second major requirement that may help man know nature more authentically. As he explains in "Tintern Abbey," "the affections gently lead us on" to the suspension of our normal perceptions. Or, as he described this emotional force elsehwere: "the passions that build our human soul"; "thanks to the human heart by which we live"; "the strong creative power of human passion."[20] For Wordsworth, the emotions -- i.e., passions, heart, affections -- provide the link between the sensible world of nature's everyday things and the possibility of deeper human penetration into that world. Without a heartfelt wish to look into nature's depths, we will not be able to see. If one can extend his feelings to the scene he views, then he may in time discover the "deeply interfused" sublime sense that Wordsworth describes in "Tintern Abbey."

In terms of affective development, Wordsworth believed that the human emotions work in a kind of virtuous circle that needs to be started in the person when he is a child.[21] Wordsworth was distressed that the traditional schooling of his time emphasized the development of the intellect, while the emotions were allowed to starve or grow as they will; as he explains in The Prelude:[22]

> How little those formalities, to which
> With overweening trust alone we give
> The name of Education, have to do
> With real feeling and just sense.

Ideally, childhood training should awaken the emotions and guide their attachment to beautiful and worthy things. Wordsworth believed that as the emotions grew, so "In dignity or being we ascend."[23]

The natural world is particularly important in emotional development because it not only calls forth positive affections but also expands and strengthens them.[24] Nature is the source of the "objects that endure," and frequent contact with these objects widens the child's heart and opens his spirit:[25]

> ...from my first dawn
> Of childhood didst thou intertwine for me
> The passions that build up our human soul
> Not with the mean and vulgar works of man,
> But with high objects, with enduring things--
> With life and nature, purifying thus
> The elements of feeling and of thought,
> And sanctifying, by such discipline,
> Both pain and fear, until we recognize
> A grandeur in the beatings of the heart.

In a virtuous circle, contact with nature fosters noble emotions which in turn enhance nature's significance. Through nature's help, according to Wordsworth, man may ultimately discover "a love that comes into the heart/With awe and a diffusive sentiment."[26]

3. Revealing a possibility. In describing the importance of an emotional bond with nature's simple things, Wordsworth provides important clues for encountering nature as he has known it. Yet in the end, he offers no practical procedure for guiding others to this heightened contact with nature. In "Tintern Abbey," for example, his special encounters are unmediated -- a particular scene like the Wye River will suddenly and by chance bestow "the serene and blessed mood." In some manner which Wordsworth doesn't record, our normal perceptions are "almost suspended" and "we are laid asleep/In body." In this state we are opened and a superior kind of understanding seeps into us -- a sense of "something far more deeply interfused." As Roszak explains, the experience itself as Wordsworth describes it is never more than this "something."[27] It may be "the latent qualities and essences of things"; "the types and symbols of Eternity"; "the shock of awful consciousness"; "authentic tidings of invisible things"; "the mysteries of being"; or "a presence."[28] But this "something" can never be defined more precisely because it is indescribable verbally -- "it is not a word; it is a helpless gasp, a catch of breath."[29] The reader can only know the experience authentically if he discovers it firsthand for himself.

In other words, Wordsworth's poetry is an experiential transcription, superb in terms of transcription, but incomplete, as all experiential transcriptions must be, in terms of the original encounter with nature. In his work, Wordsworth suggests the possibility of a special encounter with the natural world, but offers no practical way of fostering this experience in other individuals. Thus, we turn to Goethe, who knows the same kind of encounter and provides a substantial program for promoting its presence in others.

III. Johann Wolfgang von Goethe: Fostering the Encounter

Just as Wordsworth and other Romantic poets sought to break away from the trends and conventions of the preceding Augustan Age in England, so young Goethe and his contemporaries sought escape from the prevailing intellectual and literary traditions in

Germany.[30] Rejecting the domination of rationality and the traditional French and Classic models and rules, this German Romantic movement, like the English, turned to the originality of genius and immagination -- inborn creative spirits that intuit their own rules. Nature itself has henceforth to be the poet's and artist's only teacher, particularly as it manifested itself through the things and processes of the natural world -- which Goethe loved with the same passionate and religious feeling as Wordsworth.

Yet during the later ten-year period that Goethe became advisor to the court of Weimar and a key figure in governmental administration, his strong emotionalism tempered. Restraint and control, balance and harmony became his ideals in life and art. In his new attitude, which he held for the rest of his life, he took the task of every individual to be the greatest possible development of all his talents into a harmonious personality. With this new attitude to life, Goethe continued to respect and study nature, believing that through it man could discover more about himself and so become more balanced as a person.

Like Wordsworth, Goethe viewed nature as a kind of secret script that might reveal to the sensitive, searching individual an underlying spiritual unity in nature's seeming material diversity. Just as Wordsworth knew a religious communion with nature, so Goethe knew the same encounter, recognizing firsthand "that mankind exists in her [nature] and she in all mankind."[31] As Wordsworth is suddenly filled with nature's strong but quiet presence in "Tintern Abbey," so Goethe knew the same experience: "Natural things all flow together, so that once you have embarked you are carried by the current."[32] The best philosophy, then, seeks to reveal man's spiritual unity with nature and its recurring processes:[33]

> ...when it [philosophy] is bent on unifying, or should I say, when it intensifies our original feeling that we are one with nature; when it secures this feeling and transforms it into a deep, steady intuition of the divine life in its ceaseless ebb and flow, even if such is not for us mortals to lead -- then I welcome philosophy and you can gage my interest in your work accordingly.

Also like Wordsworth, Goethe sought the discovery of nature's oneness in the small, unassuming things of the natural world. He recognized the presence of a universal intentional force which manifested in everything everywhere -- "even in the plants and stones, in herbis et lapidis."[34] As his secretary Eckerman explained, Goethe once told him that "nothing in nature is lifeless" -- even in a piece of sugar is there life."[35] Or as Goethe himself wrote:[36]

> Life makes its abode in the tiniest mouse as it does in the colossus of the elephant, and it is always the same. Similarly in the smallest moss as in the largest palm.

Although Goethe is popularly known today as one of the most outstanding dramatists and poets of all ages, his great respect and love for the natural world led him to conduct a great variety of superb scientific studies in such diverse fields as botany, osteology, comparative anatomy, geology, climatology, and optics.[37] It is in these scientific studies that Goethe's encounter with the natural world begins to differ from Wordsworth's experience, and becomes potentially more reproducible for other interested individuals. As we pointed out before, Wordsworth's encounter with nature was always unexpected, and generally involved a natural setting, such as the Wye riverscape in "Tintern Abbey," which suddenly becomes intensely real. Goethe, on the other hand, knew the same encounter with nature, but sought to channelize it -- to being its presence to particular natural phenomena and so better see and understand them through the intense force of this special awareness.

In making use of this sensitive kind of understanding -- "contemplative non-intervention," as Roszak calls it -- Goethe forsook the method of conventional science, which analyzed and interpreted the thing in terms of its parts -- all pre-defined by the researcher.[38] Instead, Goethe sought to use the possibility of heightened encounter with nature as a way to enter into the thing as it was in itself before man had defined, categorized, and labelled it. Unlike the conventional scientist, Goethe did not separate himself from the world he studied, but sought to reverently encounter it -- to penetrate its manifestation through an active kind of receptivity. By merging with the thing, the investigator might discover the thing in its own terms, and at the same time he might better understand his own nature -- for what the natural world was, he was also.

To highlight Goethe's way of science more clearly, and to demonstrate its applicability in developing other people's understanding of nature, let us briefly look at his Theory of Colours, which seeks to reveal the nature of color and light as they manifest naturally in their own terms.

Because of his doubts about Newton's theory of light, Goethe began studying light and color in the late 1780's and published his work effort Theory of Colours, in 1810.[39] The excellence of his color theory is its experiential source: rather than imposing theoretical statements, Goethe sought to allow light and color to manifest themselves in their own fashion through an ordered series of simple experiments that any reader can conduct for himself. Goethe firmly claims that if the student carefully performs these experiments with "unremitting and close application," he will discover out of his own experiential observations the underlying

patterns through which all color manifests itself.[40] According to Goethe, the basic pattern responsible for the expression of color is the tension between light and darkness. We will not be concerned here as much with the actual rightness of this fact as with the method of experimenting that Goethe uses to demonstrate this fact to us.[41]

To get some idea of Goethe's way of experiential proof, we can briefly examine the beginning of the Theory of Colours, which considers physiological colors -- i.e., colors contingent upon the state and activity of the eye -- as, for example, colored afterimages. Assuming that the reader knows practically nothing about light and color, Goethe first considers the effect of light and darkness in general terms. He asks us, the readers, to consider the following experiences, to conduct them as experiments:

1. To keep our eyes open in a totally dark place for a period of time and observe the resulting experience as it happens.

2. To look at a white, strongly illuminated surface, then turn to objects moderately lighted, observing the experience as it happens.

3. To quickly pass from bright daylight to complete darkness, observing the change as it happens.

Though he emphasizes the importance of conducting these experiments for ourselves, Goethe also describes the experiential results of each experiment. In the second experiment, for example, he explains that the eye is dazzled, and for a time cannot distinguish the moderately lighted objects; in the third situation, the sudden change has such a great impact that for a time we can see nothing. Goethe concludes in this opening section of "The Effects of Light and Darkness on the Eye" that these experiments demonstrate the two extreme states in the eye: the first experiment reveals the eye "in the utmost relaxation and susceptibility," while the second shows the eye "in an overstrained state and scarcely susceptible at all."[42] It is between these two extremes -- complete light, complete darkness -- that normal vision and colors occur, and it is to this normal situation of seeing that Goethe next turns, considering the effects on our eye of such phenomena as black and white seen together, grey surfaces and objects, colored shadows, and subjective halos.

Having provided a brief introduction to the format of Theory of Colours, we must now ask ourselves if it promotes in some way a deeper and more authentic encounter with nature. Clearly, it involves the individual directly with color and light as they manifest themselves in his own experience, but does this first-hand contact heighten one's understanding of the natural world? Experiments like the above reveal taken-for-granted phenomena that we can see in our everyday situation. For example, the third experiment

described is readily experienced when on a sunny day we drive our car into an unlighted tunnel. How exactly do we benefit by experiments that duplicate such well-known experiences?

1. Revealing the fullness of light and color phenomena. One important contribution of Theory of Colours to our better appreciation of the natural world is its provision of a great number of experiments which integrate many different natural manifestations of light and color. Though many of the experiments deal with simple events that are already known to most people, many other experiments deal with less noticed, everyday phenomena such as colored shadows, the effect of a dense medium on color, and the way in which color manifests itself through prisms.

In Theory of Colours, Goethe is able to convincingly demonstrate that all these well and less known phenomena reveal similar patterns and processes. Besides the physiological colors (largely the result of processes within the eye itself), Goethe discusses physical colors (colors created by the intervention of a transparent or semi-transparent medium -- for example, a prism or the atmosphere -- between experiencer and scene), chemical colors (colors inherent to substance -- for example, the red of a rose), and the moral and ethical significance of colors (for example, Goethe suggests that yellow in its purest form "has a serene, gay, softly exciting character").[43] In conventional science, a different discipline would investigate these different manifestations of color -- for instance, the chemist would study chemical colors; the physicist, physical colors. By this usual method, the unity of the color phenomena itself is sacrificed -- broken into parts for the sake of scientific inquiry. Goethe's considerable achievement is the rescue of color's integrity. By considering color as phenomenon of human experience, Goethe is able to maintain its wholeness and reveal to the student its extensive breadth of manifestation and underlying similarities.

2. Revealing color phenomena in the everyday world. Theory of Colours also works to extend our encounter with nature because it provides striking examples of colors as they appear in the world which we daily take for granted. Goethe's deep interest in light and color arose primarily from his continual curiosity in the natural world which he revered so much. Because he sought evidence of his scientific findings in his everyday contacts with nature, and because most of those findings arose out of that everyday contact, Goethe beautifully blends theory and everyday experience in Theory of Colours, providing many real-world examples of the phenomena that his experiments reveal in more artificial fashion.

For example, in demonstrating that a white disc on black background appears larger than a black disc on white background, Goethe relates this phenomenon to the everyday fact that the moon's lighted crescent appears to belong to a larger disc than the remaining darker portion; to the fact that the rising or setting sun appears to make a notch in the horizon; and to the observation that people

dressed in black appear smaller than if they are dressed in white.[44]

Perhaps Goethe's most elegant account of a natural-color phenomenon occurs in the section on colored shadows, when he describes an experience he had as he was traversing the Harz mountains:[45]

> In travelling over the Harz in winter, I happened to descend from the Brocken towards evening; the wide slopes extending above and below me, the heath, every insulated tree and projecting rock, and all masses of both, were covered with snow or hoarfrost. The sun was sinking towards the Oder ponds. During the day, owing to the yellowish hue of the snow, shadows tending to violet had already been observable; these might now be pronounced to be decidedly blue, as the illuminated parts exhibited a yellow deepening into orange.
>
> But as the sun was at last about to set, and its rays, greatly mitigated by the thicker vapors, began to diffuse, a most beautiful red color over the whole scene around me, the shadow colour changed to a green, in beauty to the green of emerald. The appearance became more and more vivid: one might have imagined oneself in a fairy world, for every object had clothed itself in the two vivid and harmonising colours, till at last, as the sun went down, the magnificent spectacle was lost in a grey twilight, and by degrees in a clear moon-and-starlight night.

This example (along with other illustrations relating to such things as moonlight and underwater shadows) nicely substantiates the colored-shadow experiments outlined by Goethe in Theory of Colours and effectively demonstrates their relevance to everyday events. Thus, we see that Goethe usefully assists the student in discovering more about his taken-for-granted world by linking experiments to everyday color occurrences in nature. As the student discovers more, so he seeks more, which in turn leads to further discoveries. Where there was no differentiation before, there is now recognition and pattern. In short, Goethe's Theory of Colours provides the possibility of opening man's eyes to a new dimension of nature that he more than likely hadn't noticed before.

3. Promoting a spiritual ecology. Goethe believed that the hardest thing of all is that which seems easiest: "to use your eyes to see what lies in front of them."[46] In opening our eyes to a world of color that more than likely we hadn't seen in the past, Theory of Colours may simultaneously promote a greater respect and reverence for that world because new-found discoveries -- like a colored shadow, or a colored afterimage -- may bring with them a small joy and a growing appreciation. In time, Goethe believed, the observer will not "see a pure phenomenon with his eyes, but more with his soul."[47] Eventually, so Goethe believed, this soulful understanding may extend into many dimensions of nature, and the student will discover:[48]

> Nothing "inside" or "Out There,"
> The "outer" world is all "In Here."

Just as Wordsworth emphasizes the importance of "unassuming things" in his encounter with nature, so Goethe in his Theory of Colours focuses on simple, everyday phenomena in the natural world. Through a loving consideration of these ever-present things -- and it is important to recognize that Goethe studied many other everyday phenomena including plants, weather, and rocks in the same way -- interested individuals may eventually be able to quietly marvel at the hidden order of the natural world. With further effort and practice, they may even understand as Goethe and Wordsworth understood that "No living thing lives separate: One and Many are the same."[49]

IV. Wordsworth and Goethe Together: Their Understanding of Man/Nature and Its Significance to Geography and Other Man-Environment Studies

For a Western world that has only recently begun to acknowledge the physical linkages and energy flows that bind all earth objects, organisms, and processes inseparably together in an intricate earth ecosystem, the possibility of the higher, more sensitive bonding that Wordsworth and Goethe apprehended may strain credibility and have every appearance of mysticism. In fact the experience of Wordsworth and Goethe might by some people be termed "mystical," though as Roszak explains, it is a kind of mysticism "returned once again to the simple contemplation of nature."[50] In today's time of occult fads, we certainly need to be wary of mystical encounter, which can be as often artificially contrived and pretended as genuinely felt and experienced. On the other hand, we also need to respect its possibility because an a priori rejection may very well exclude its potential occurrence for the person who repudiates it.

Modern science's skepticism of mystical encounter notwithstanding, the possibility of this kind of intuitive understanding is well founded, at least historically. As Havens explains, the answer to critics of the mystical contact with nature "is to be found in the experience of those -- and they are neither few, nor, as a rule, intellectually contemptible -- who have found in nature a great aid to noble living and high thinking."[51] For both Wordsworth and Goethe, nature was clearly the greatest of such aids, and these men's descriptions and discussions lucidly sustain the overwhelming authenticity of their special firsthand encounter with the natural world. If most Western men today know nature as an isolated entity apart from man -- as either exploitable resource or viewable landscape -- Wordsworth and Goethe knew nature as a spiritual mergence in which they better discovered themselves. Whereas modern man understands nature primarily with his intellect and senses, Wordsworth and Goethe understood nature primarily through the heart and spirit.

To varying degrees, all of us know this kind of encounter -- for example, experiencing on one particularly lovely day a joy and peace that is not only in one's heart but also in the hills and fields around us -- "in the heart of Nature," as Wordsworth expressed it.[52] Wordsworth's and Goethe's crucial contribution to our modern-day understanding of nature is their recognition that this special emotional apprehension of nature can be extended and intensified. If we trust these two men's descriptions of the process, a spiritual ecology begins with simple recognition and discovery -- as of, for example, a particular color phenomenon. With effort and practice, our appreciation of nature grows -- for example, we understand more and more completely particular patterns of color; more importantly, we become more and more respectful and appreciative. In time, we may discover an overwhelming presence that pervades all things. As Wordsworth says, we have encountered -- if only momentarily -- "a sense sublime/Of something far more deeply interfused" whose dwelling is in all things. In an ultimate sense, we have discovered an experiential love of earth -- and universe.

In his previously mentioned essay "Land Ethic," Aldo Leopold argued that an ethical relation to nature is inconceivable "without love, respect, and admiration."[53] More than likely, it is through the kind of encounter known by Wordsworth and Goethe that this emotional bond of which Leopold speaks might manifest itself most forcefully. If so, the creation and propagation of this special relationship with nature becomes one very important foundation for Leopold's ecological consciousness. Of course, this does not mean that all men and women can or should know the intensity of experience that Wordsworth and Goethe sometimes felt -- in fact, it may be that few individuals can discover the same force of experience which Wordsworth and Goethe knew. Yet if this experience can manifest itself at various degrees and levels, it becomes important that a situation be fostered that potentially sustains this kind of encounter because all individuals may be able to receive some taste of its presence.

It is also important to point out here that a search for this alternative way of knowing nature does not mean that we discard our predominant subject-object relationship with the physical environment in favor of man/nature mergence. Although Wordsworth and Goethe were both able to quietly converse and attend to nature, they also contacted nature actively and recognized its service as natural resource. Wordsworth, for example, was an excellent landscape gardener, while Goethe in his administrative duties at Weimar directed road construction, forestry, mining, and several other operations relating to the natural environment.

If anything, Wordsworth and Goethe's special encounter with nature helped them to use natural resources more wisely, fostering in the two men a fervent ecological consciousness of which Leopold no doubt would have approved. Wordsworth, for instance, fiercely defended nature's rights; his Guide to the Lakes, a tourist direc-

tory to his native English Lake District, is full of derision for those outsiders who would despoil or counterfeit nature's works in his beloved region. As Noyes explains, his protests[54]

> were not so much made for himself as in the name of Nature and on behalf of future generations. His indignation was little and his love was much.

We see, then, that a striking feature of Wordsworth's and Goethe's spiritual ecology may have been its power to purify these men's active relation with nature in a way which helped them to put nature's interests first, and man's second. In their balanced relation with the natural world, Wordsworth and Goethe both demonstrate the capacity to know nature actively as well as receptively; they were able to separate from nature and act on it as agent, as well as merge with nature and know it in communion.

If we ask, then, the central message on environment that Wordsworth and Goethe speak to modern men and women, it is that the most satisfactory ecological and existential relationship between man and nature is dynamic and flexible. At times man should be able to justly act on nature and use its resources wisely; at other times he should be able to open his heart to nature, and discover his human membership in a supremely greater organic whole that binds all things integrally together. If men and women could make better use of this ever-changing tension between activity and receptivity, action and rest, Wordsworth and Goethe suggest, then the man/nature relation as well as man himself might be much more in harmony -- externally and internally.

For geography and other disciplines which deal with environmental and ecological issues, Wordsworth and Goethe's message on environment has crucial bearing because it extends the nature of the man-environment relationship to realms of experience which in the past have been largely discounted or converted into terms which make them accessible and understandable to methods of conventional science. In seeking to imitate the success and exactitude of the natural sciences, geography and other disciplines attempting to understand man's role as an environmental and ecological creature have too often in the past accepted without question that scientific protocol be the foundation of their studies. In consequence, they have also had to accept the particular requirements of that protocol, particularly the stipulation that appropriate data for study be empirical -- i.e., information which is directly perceivable by one of the five senses. Any experience or phenomenon which can not be reduced to some tangible form is immediately suspect and rejected as irrelevant, epiphenomenal, or imaginary.[55]

In their way of knowing nature, Wordsworth and Goethe demonstrate a way of study which provides a radically new complement to the conventional scientific approach to environment and environmental experience. Both men ask the student to meet the natural

world in its own terms, to patiently lie wait for its intangible significances as well as its empirical, readily accessible manifestations. Whereas conventional scientific method pre-judges phenomena and perhaps too often assumes terms and concepts which may have no legitimate existence in the real world, Wordsworth and Goethe ask for an attitude of openness to the world, which in its own time and fashion will disclose itself as it itself is. Whereas most present-day scientific research treats its studied object as a thing 'out there' separate from the student, Wordsworth and Goethe ask the student to merge with the studied thing -- to grasp its significance empathetically and intuitively.

Firstly, then, The Wordsworthian/Goethean way of encountering the natural world is important to man-environment studies because it fosters a special kind of exploration which respects nature's integrity and allows it to reveal itself in its own way and time. Goethe's scientific work is especially significant in this regard because it provides a set of already-existing programs through which the student can begin to understand such phenomena as light, color, and plants, as they manifest directly in his own experience of them.[56]

Secondly, and in a closely related way, the work of Wordsworth and Goethe is significant to man-environment studies because it provides a practical foundation for extending our attitudes toward nature in a substantially new direction. Already this paper has argued that most Western people today view nature as either resource or scenery. Wordsworth and Goethe provide a practical means for discovering that the natural world may also be a living presence whose intentionality of manifestations will speak if we would only develop the appropriate faculties to listen.

In other words, Wordsworth and Goethe's kind of encounter with the natural world has an extremely important bearing on our modern-day vision of the man-environment relationship because it extends that vision and brings to nature a dignity and purposefulness that invokes in man a sense of wonderment and reverence. In their way of meeting nature, Wordsworth and Goethe suggest a way of exploration through which the student may make new, appreciative discoveries about the natural world which he or she too often takes for granted. Small, unnoticed things like a colored shadow in the street at twilight or the pattern of a leaf that has just fallen to the ground may suddenly come to the student's attention and suggest partial patterns and small significances which in time may spontaneously combine to indicate wider patterns and larger significances. As the student becomes ever more aware of the overwhelming unity of form and process that underlies nature's seeming diversity, he may begin to feel and relate toward nature in a deeper, more responsible way.

In this sense, Wordsworth and Goethe suggest that nature is a prime teacher who most importantly instructs through the heart and spirit, fostering and nourishing a quiet reverence and unselfish

love for all things of earth. Wordsworth's poetry describes to us the possibility of this kind of instruction from nature, while Goethe's special brand of science provides one vehicle for its actualization. If Wordsworth and Goethe's experience of nature holds some amount of rightness -- which is more than likely because of these two men's extraordinary sensitivity -- then its introduction as a legitimate approach to man-environment studies might in time help to generate the kind of ecological consciousness that Leopold so urgently advocated so many years ago.

Footnotes

[1]A large portion of this essay is based on a presentation, "Revering Nature's 'Unassuming Things': Wordsworth's and Goethe's Experience of the Natural World -- Implications for Modern Men and Women," given at the national symposium-fair, "Children, Nature, and the Urban Environment," at the George Washington University, Washington, D.C., May 19-23, 1975. In helping me with this paper in various ways, I'd like to thank Roger Hart, Walter Schatzberg, Bert Woolard, Doug Kniffin, Peter Barach, Michael Steinitz, Anne Buttimer, and especially, Wendy Hussey.

[2]Book I, lines 10-16. Quoted from The Complete Poetic Works of William Wordsworth, Andrew J. George, Ed. (New York: Houghton Mifflin, 1904), pp. 124-25.

[3]Theodore Roszak, Where the Wasteland Ends (New York: Doubleday, 1973); Paul Shepard, "Introduction: Ecology and Man -- A Viewpoint," pp. 1-10 in his The Subversive Science: Essays Toward an Ecology of Man, co-edited with Daniel McKinley (Boston: Houghton-Mifflin, 1969). Also, see several of the essays in Ian G. Barbour, ed., Western Man and Environment Ethics (Reading, Massachusetts: Addison-Wesley, 1973). For a brief but extremely lucid overview of man's ecological and existential relation with nature, see Yi-Fu Tuan, Man and Nature (Washington, D.C.: Association of American Geographers, 1971).

[4]Roszak, pp. 22-26. Also, see Daniel J. Boorstin, Chapter 3, "The Lost Art of Travel," in his The Image: A Guide to Pseudo-events in America (New York: Harper, 1961); and David Rounds, "The Education of a Romantic in the Backwater," New York Times Travel and Resort Section, Sunday, 20 June, 1971, pp. 1-2, 16, 19, 20.

[5]Roszak, p. 7.

[6]Aldo Leopold, "Land Ethic," Sand County Almanac (New York: Sierra Club/Ballantine Books, 1970).

[7]Ibid., p. 258.

[8]Quoted in Roszak, p. 290.

[9]Quoted in Ibid., pp. 312-313.

[10]Many students of the environment will no doubt oppose the kind of man-nature encounter described in this paper; see, for example, John Passmore, Man's Responsibility for Nature (New York:

Charles Scribner's Sons, 1974), especially Chapter 7, "Removing the Rubbish." On the other hand, the thesis presented here would more than likely win support from scholars such as Lynn White; see his now-classic essay, "The Historical Roots of Our Ecological Crisis," which originally appeared in Science, Vol. 155 (10 March, 1967), pp. 1203-07. The present paper wholeheartedly accepts White's contention that the roots of the ecological crisis are religious, thus "the remedy must be essentially religious, whether we call it that or not" (White, p. 1207). I ask here if the way in which Wordsworth and Goethe experienced nature might provide one practical means for re-establishing the sense of reverence for environment with which White argues our Western society has lost contact and to which it must again return if it is not to perish ignobly.

[11]For a useful overview if the Romantic Period, see M. H. Abrams, et.al., eds., The Norton Anthology of English Literature, Vol. II, pp. 1-22 (New York: W. W. Norton and Company, 1962). For two excellent discussions of Wordsworth's encounter with nature and landscape, see Russell Noyes, Wordsworth and the Art of Landscape (Bloomington: Indiana University Press, 1968) and J. R. Watson, Picturesque Landscape and English Romantic Poetry (London: Hutchinson Educational, Ltd., 1970).

[12]Roszak, p. 291.

[13]Noyes, p. 250.

[14]All quotations from "Tintern Abbey" are taken from Abrams, et.al., pp. 76-80. My interpretation of the poem has been very much helped by Noyes, pp. 243-50 and Watson, pp. 79-87.

[15]See Noyes, pp. 201-05, for a good discussion of the difference between Wordsworth's and the traditional landscapes poets' descriptions of landscape.

[16]Raymond Dexter Havens, The Mind of a Poet, Vol. I (Baltimore: The John Hopkins Press), p. 2.

[17]Quoted in Ibid., p. 30.

[18]In Complete Works (see note 2), p. 311.

[19]Havens points out that many of Wordworth's most striking experiences of nature involve things that to the less sensitive individual might seem ugly or unpleasant, such as "woods decaying" "rocks that muttered," or "black drizzly crags" (Havens, p. 97). Yet even in these examples, it is not overwhelming and exotic natural scenes that impress Wordsworth, but ordinary things (such

as woods and rocks) that because of situation or atmosphere generate loneliness, fear, or mystery.

[20]Quoted in Ibid., pp. 29-30.

[21]The vast majority of discussion on environmental education suggests that increased cognitive understanding of nature will promote a stronger ecological consciousness. See, for example, most of the essays in James A. Swan and William B. Stapp, eds., Environmental Education (New York: John Wiley and Sons, 1974). In contrast, this paper argues that strong emotional contact with the natural world may ultimately foster a deeper, more lasting ecological concern than simple intellectual understanding of environmental issues. Other work echoing this same view include Roszak and Theodor Schwenk, Sensitive Chaos (London: Rudolf Steiner Press, 1961). Clearly, Wordsworth emphasized this same view in his few explicit comments on child education.

[22]Quoted in Ibid., p. 31.

[23]Quoted in Ibid., p. 31.

[24]Havens explains that fear of nature was as important to Wordsworth's understanding of nature as love and reverence. As a force in Wordsworth's development, however, fear seems to have been more important in stimulating his imagination and stamping impressions on his memory than revealing the natural world's spiritual unity. See Havens, Chapter III.

[25]Quoted in Ibid., p. 32. "Thou" in this passage refers to nature.

[26]Quoted in Ibid., p. 32.

[27]Roszak, p. 295.

[28]Quoted in Ibid., p. 294.

[29]Roszak, p. 295.

[30]For a helpful biography of Goethe, see G. H. Lewes, The Story of Goethe's Life (Boston: Houghton-Mifflin Company, 1898). For a good bibliography on Goethe and his relevance to modern society and science, see Roszak, p. 446; also, see Ernst Lehrs, Man or Matter: Introduction to a Spiritual Understanding of Matter Based on Goethe's Method of Training, Observation and Thought (London: Faber and Faber, Ltd., 1958).

[31]Johann Wolfgang von Goethe, Goethe's Botantical Writings, translated by Bertha Mueller (Honolulu: University of Hawaii Press, 1952), p. 243.

[32]Quoted in H. G. Haile, Artist in Chrysalis: A Biographical Account of Goethe in Italy (Urbana: University of Illinois Press, 1973), p. 119.

[33]Quoted in Ludwig Curtius, ed., Goethe: Wisdom and Experience, translated by H. J. Weigard (New York: Pantheon, 1949), p. 115.

[34]Quoted in Arnold Bergstraesser, Goethe's Image of Man and Society (Chicago: Henry Regnery Company, 1949), p. 45.

[35]Quoted in Curtius, p. 137.

[36]Quoted in Ibid., pp. 136-37.

[37]For a useful, but somewhat dated, account of Goethe's scientific work, see Rudolf Magnus, Goethe as Scientist, translated by Heinz Norden (New York: Henry Schuman, 1949); also, see Roszak, pp. 302-17.

[38]Roszak, pp. 302-06.

[39]Perhaps the best English edition of Theory of Colours is Rupprecht Matthaei, ed., Goethe's Color Theory (New York: Van Nostrand-Reinhold, 1971); this book is annotated and includes an excellent series of drawings, diagrams, and paintings. Also good is Johann Wolfgang von Goethe, Theory of Colours (Cambridge: MIT Press, 1970). Quotations in this paper are taken from the latter edition.

[40]Ibid., p. li.

[41]Curiously, the opinions on the scientific validity of Goethe's light and color theory are extremely varied. One highly qualified commentator, Charles Gillispie, has called Theory of Colours subjective, sentimental, and "the painful spectacle of . . . a great man making a fool of himself" -- see Gillispie's book The Edge of Objectivity (Princeton: Princeton University Press, 1960), pp. 192-201 (quotation on p. 196); for another attack on Goethe's theory, see George A. Wells, "Geothe's Scientific Method and Aims in the Light of His Studies in Physical Optics," Publications of the English Goethe Society, New Series Vol. XXXVIII, E. M. Wilkinson, et.al., eds. (Leeds: W. S. Maney and Son, Ltd., 1968),

pp. 69-113. Other students of science have argued that Theory of Colours has at least heuristic value for scientists -- see, for example, Arthur G. Zajonc, "Goethe's Theory of Color and Scientific Intuition," American Journal of Physics, XLIV, 4 (April, 1976), pp. 327-33. Interestingly, some recent scientific studies suggest that Goethe's work may ultimately be more in tune with light and color phenomena than conventional scientific theories, which all draw heavily from the Newtonian perspective that Goethe so much disliked; see, in this regard, M. H. Wilson, "Goethe's Color Experiments," in Year Book of the Physical Society (London: The Physical Society, 1958). The best defense of Goethe's science is perhaps Ernst Lehrs' Man or Matter (see note 30).

[42]Goethe, Theory of Colours, p. 3.

[43]Ibid, p. 307.

[44]Ibid., p. 6.

[45]Ibid., p. 35. There are many other observations in Theory of Colours describing similar natural phenomena; they should be of considerable interest to the physical geographer and other students of the earth and atmosphere.

[46]Roszak, p. 310.

[47]Quoted in Ibid., p. 316.

[48]Quoted in Ibid., p. 316.

[49]Quoted in Ibid., p. 316. I don't mean to suggest here that Wordsworth and Goethe understood nature in exactly the same way or with the same kind of clarity. Clearly this is not the case. The significant similarity, as I've already pointed out, is that both men understood in a profoundly spiritual sense that behind the seeming diversity of nature was an all-pervading unity. Goethe sought to actively direct and use this understanding, and perhaps because of these efforts his powers of perception and intuition lived strongly within him throughout his lifetime -- even in the last few years before his death. In contrast, Wordsworth seems to have had no interest in directing or preserving his intuitive capacities, and by the age of thirty had lost most of "the visionary gleam" (see Roszak, p. 299).

[50]Roszak, p. 316.

[51]Havens, p. 118.

[52]Quoted in Ibid., p. 81.

[53]Leopold, p. 261.

[54]Noyes, p. 178.

[55]Probably the phenomenologists have so far done the best job of making explicit the taken-for-granted world view of science. See, for example, William A. Luijpen, Existential Phenomenology (Pittsburg: Duquesne University Press, 1960). Also very good is Amedeo Giorgi, "Phenomenology and Experimental Psychology: I and II," Duquesne Studies in Phenomenological Psychology, Volume I, Amedeo Giorgi, et.al., eds. (Pittsburg: University of Duquesne Press, 1971). Another excellent critique of conventional science (written by a non-phenomenologist) is Abraham Maslow, The Psychology of Science (Chicago: Henry Reghery Co., 1969). Maslow's portrait of an expanded scientific method is in many ways similar to a science founded on Goethean principles. See especially, Chap. 11, "Interpersonal (I-Thou) Knowledge as a Paradigm for Science."

[56]One need in this regard is a series of additional programs, which could extend a Goethean awareness to other things and processes in the natural and human worlds. For example, Theodor Schwenk (see note 21) has applied a Goethean science to water and other fluids. He asks what water might be if we consider it to be a living presence rather than a resource to be exploited. The resulting understanding of water is considerably different from that gained in conventional geology and physical-geography textbooks. No doubt there are many other programs that might foster the same kind of quiet appreciation that Goethe's work does. More than likely the arts have a major contribution to make. For example, Kimon Nicholaides' superb book The Natural Way to Draw: A Working Plan for Art Study (Boston: Houghton-Mifflin Co., 1949) provides an excellent set of 'do-it-yourself' exercises that improve the student's drawing and also intensify his respect for the things he draws. Applied to environmental themes, these exercises could do much to kindle love of nature. They are readily adaptable to many of Goethe's specific experiments which involve color and vegetation.

Temporal Concepts and Explanation in Geography

by COURTICE ROSE

> Next for discussion after the subjects mentioned is Time. The best plan will be to begin by working out the difficulties connected with it, making use of the current arguments. First, does it belong to the class of things that exist or to that of things that do not exist? Secondly, what is its nature?.... One part of it has been and is not, while the other is going to be and is not yet. Yet time - both infinite time and any time you like to take, is made up of these. One would naturally suppose that what is made up of things which do not exist could have no share in reality.
>
> Aristotle, Physics Book IV.[1]

I. Introduction

Even a cursory glance at contemporary geographical writing would reveal that, at least as far as the majority of geographers is concerned, Aristotle's next discussion never got off the ground. The fact that space and not time, has been the major philosophical focus of geography needs no elaboration -- an inordinate amount of mental effort has been expended on the study of spatial concepts in geography and precious little on temporal concepts. What this has meant for the discipline is that a large body of literature devoted to the psychological, social and subjective notions of time as well as expanded notions of "objective time" derivative of relativity theory has gone largely unnoticed. When challenged on the question, most practitioners in the discipline would probably fall back on some type of "fourth dimension" definition similar to Brian Berry's scheme,[2] wherein time was conceived as a "slice of reality." If the year were 1929, the place Vienna, and the teacher Rudolf Carnap, then we might be inclined to accept such a notion of time -- but neither of these conditions presently hold; we own it to ourselves and to the field of geography to reexamine the question of time, and particularly its role in explanation in geography.

In short, the problem revolves around a conceptual difficulty concerning the nature of time. Physicists, and most natural scientists use a posteriori models of time, models developed out of experiments aimed at finding the suitable metric to express the notion of time (second, hours, light-years) and using this metric to calibrate hypotheses about the motions and processes of bodies in the universe. Social scientists, on the other hand, have tended to conceive of time in an a priori fashion: time is a subjective, "felt"

experience, "a mental device to give order to events."[3] Conceived as such, there have been two major problems involved in treating time in geography.[4]

> (i) A substantive problem wherein the researcher comes to realize that 'clock-time' is not simply another X in a list of independent variables but is rather a parameter to be gauged in each different social situation. Every individual has a slightly different perception of time; that perception will affect his behavior in both an immediate sense (e.g., the individual's daily time 'budget') and in the most distant sense (e.g., a farmer's 'long-run' thinking concerning cropping practices). So the substantive problem revolves around the principal consideration of constructing individual and group time scales to cover the variety of activities and places the researcher is studying.
>
> (ii) A methodological problem wherein the researcher realizes that he himself is emotionally involved in choosing a suitable model of time. Does he embrace the "being and becoming" model (Heraclitus, Bergson, Grunbaum) or hold with the time as discrete "bits" viewpoint (Zeno, Kant, Reichenbach)? And then there is the problem of isomorphism: do our models of time fit the research situation they were designed for? How do we know, for example, that our model of the geological time scale works when we have direct knowledge of only a fraction of that time scale? -- the rest must be inferred from evidence 'dated' somewhere in the past.

This paper will examine some of the epistemological issues involved in the preceding problems as they have been of interest to geographers.

II. Concepts of Time in Geography

(1) Classical Concepts. The Presocratic philosophers Heraclitus and Zeno had already posed the question 'what is time'? and the answer was not all that simple. Time was defined by Aristotle as "the number of movements in respect of 'before' and 'after'."[5] Motion was an attribute of a substance and time in turn was an attribute of motion. Time was not motion but the number or measure of motion. Thus time was not viewed as a substantial entity which had a separate existence apart from other things; it was composed of an infinitely large number of dividable 'moments', each of which consisted of a part which 'has been' and a part which 'is not yet'. Therefore, time was inseparable from the notions of change, motion and the idea of "space traversed." Time was like a mathematical point dissecting a line, it serves to end one segment and begin the other. Plotinus argued that Aristotle's linking of time and motion was a circular argument: motion presupposes time since motion

is defined as the occupation by one entity of a continuous series of places at a continuous series of times. Herein lay the crux of the matter for any absolute definition of time. Any definition of time is based on a method of measuring time. If we define a clock as a closed system which will return to exactly the same state in which it found itself at some earlier instant of time, then the major requirement for temporal measurement is that two different observations (non-simultaneous) be made of the measuring scale. And if by non-simultaneous we mean occurring at different times, then time can never be defined. This dilemma of definition caused St. Augustine to give up the notion of the 'present' having a finite duration, and to revert to the idea of time as a 'protraction' of the mind, as a certain expanse of our conscious memory, thus according time a subjective rather than objective existence.

Kant was able to avoid the dilemma of time definition by postulating two types of time:

> (i) "Time is nothing but the form of inner sense, that is, of the intuition of ourselves and of our inner state."[6] This type of "inner time" was given a priori, had only one dimension and was not derived in any way from empirical phenomena.
>
> (ii) In the case of the history of nature, however, time was viewed in an objective sense since all history must concern the "synthesis of the manifold of outer appearances in time."[7]

This distinction between time in an "inner" and "outer" sense, did however, create a very serious epistemological problem: if "inner time" can refer only to the sense experience of each individual, then precise knowledge would only be possible on the basis of individual sense experiences. But knowledge of "outer" phenomena could also be possible for the mind and this knowledge must exist in a form of time. How then is it possible to have scientific knowledge of the world? Kant was able to solve this problem only by reference to the "transcendental object of experience," i.e., objects not given to us by sense experience, but postulated by human reason as having existed in the past. Thus, we can never know the past ourselves; we can only use a chain of causal reasoning and proceed back in time from what we experience in the present. In addition, it was quite clear that geography was not concerned with time or temporal sequences, this was the domain of the history of nature. The result was, of course, that until Carl Ritter suggested that historical perspective might have something to do with the explanation of present landscapes (1833), time and temporal notions were largely ignored in geography.

(2) The Nineteenth Century. With the rise of scientific philosophy in the 19th century, however, there was renewed interest in the notion of time in geography. The notion of physical time was expanded through the works of Leibnitz, Vico, Herder, Darwin, and

Einstein, and shown to exhibit order, uniformity, irreversibility and to be connected with notions of 'process'. The general importance of these characteristics was to discredit Kant's absolute notion of time and to replace it with a relative notion. Einstein demonstrated that the human mind is capable of conceiving of different systems of time order, among with Kant's system had only been one possible version. The selection of an appropriate time metric was, according to Einstein, an empirical matter; time was real and the result of observation, not intuitions. Absolute time would exist, only in a world where there were no upper limit for the speed of signals (of light or any other signal); but the speed of causal transmission of signals is limited in our world and therefore relative time is a more appropriate notion of time since the simultaneity (of signals) can be unambiguously defined.

The impact of relative notions of time in geology and biology preceded its introduction to geography. Both Hutton and Lyell had advanced developmental notions concerning the earth's surface in the 1830's, and Darwin, although he could not explain the original variations found in different species of animals, he did focus attention on time as a major feature of the adaptation and natural selection processes. But by the end of the 19th century, geographers had begun to introduce some rudimentary time notions into their thinking. W. M. Davis and F. Ratzel both adopted evolutionary standpoints in their studies of landscape development and the diffusion of ideas respectively. Later, Ellsworth Huntington, Griffith Taylor, and Carl Sauer were instrumental in introducing the "historical reconstruction" or genetic viewpoint to geography.[8] Thus there seemed an adequate precedent by the beginning of the 20th century for stating that whenever geographers were concerned at all with concepts of growth, evolution or change, then temporal explanations could not be avoided. Perhaps among the most convinced are Stoddart, who in writing on Darwin's impact on geography, states that evolution in geography should be conceived of as "a continuous process of change in a temporal perspective long enough to produce a series of transformations."[9]

> "Can we draw a line between history and geography? The answer is 'no', for the process of becoming is one process. All geography is historical geography, either actual or potential."[10]

The shift in focus from functional to temporal modes of explanation has not been without problems. One of these, known as the "genetic fallacy," is the belief that the significance of any phenomenon can be evaluated only by reference to its origins. This argument has its counterparts in other social sciences (particularly sociology and psychology) where it is postulated that the only complete explanations are those which allow the researcher to reproduce exactly the event, or situations under study. The viewpoint can be attacked on two fronts:

(i) Is there any reason to suppose that social science should exactly reproduce any phenomena? Surely it is the job of social science to make true statements about these phenomena but not to reproduce them in an "as-they-were-then" framework.

(ii) Exact reproduction of phenomena using a relative time notion is logically impossible. This results from the facts that social science data are of a "soft" nature, being manipulated by researchers whose concepts, beliefs and methodologies are never entirely objective and whose explanation types are decidedly probabilistic as opposed to deterministic in nature. A second reason would be that of verification -- how would the researcher know that he has in fact reproduced exactly a certain situation if the only objective referent he has available is the 'account' of the phenomena made by another researcher at some earlier time?

The second problem involves the belief that the nature of any phenomena can be entirely comprehended through a knowledge of its development. Historicism, as this point of view is known, is prone to several shortcomings. One of these is that if its intelligence were true, then we would be in the unlikely position of having a complete sociology of knowledge since we would know entirely and completely the phenomenon under study including how this knowledge was conditioned. A second problem results from the recognition that a complete account (i.e., description) of a phenomenon at different points in time in no way solves the problem of its existence or provides an explanation for its changes over time. This is so because an historical account contains no mechanism or causal system which might expalin the actions of the phenomenon under study, it rather contains only a record of what was effected.

(3) The Twentieth Century. Time in the twentieth century has been considered in a much more subjective fashion with the widening dichotomy between 'objective', 'clock-time' concepts being defined by physicists and the more general human experience of time explored in much detail by writers such as Proust, Joyce, Woolfe and Eliot, and to a certain extent by sociologists and philosophers. Meyerhoff suggests that part of the reason for this dichotomy is that time, unlike space is a more general concept, and it applies to the inner world of impression, emotions and ideas, an area for which no spatial order can be given.[11] For Bergson, we cannot introduce order among things without first distinguishing them and comparing the places which they occupy, therefore we must perceive them as multiple, simultaneous and distinct. This leads to a wholly qualitative definition of time:

"In a word, pure duration might well be nothing but a succession of qualitative changes, which melt into and permeate one another, without precise outlines, without any tendency to externalize themselves in relation to

one another, without any affiliation with number; it would be pure heterogeneity."[12]

Other writers including C. D. Broad, James, McTaggart and Grunbaum[13] have dealt with questions as to the "specious present" (a distinction between the perceptual present and the "real" or "true" present), the unreality of time, and the status of temporal becoming (i.e., becoming is mind-dependent because it is not an attribute of events per se but requires the occurrence of states of conceptualized awareness). But perhaps the most interesting research vector has been that associated with time conveived in a linguistic sense. In "An American Indian Model of the Universe," B. L. Whorf relates that the Hopi Indian language contains no tensed verbs, no temporal adjectives or any device used to refer to time at all.[14] Time appears for the Hopi Indians to be a dynamic process with no distinctions between past, present and future. This "linguistic relativism" viewpoint contends that the language used by a person determines the way in which he experiences and conceives of the world. Among the important questions raised by this viewpoint are:

(i) Do only the vocabulary and grammar of a language 'filter out' reality for the speaker?

(ii) If a word or tense for "past" or "pastness" does not exist in a language, does this mean that the speaker has no way of knowing anything other than the present?

(iii) How would such a language express the idea of "process?"

To date, the impact of twentieth century notions of time in geography has been minimal. Most, if not all, the operational notions of time utilized in geographic research embrace a static model of time wherein time is treated as a fourth dimension in a space-time language.[15] The dynamic notion of time, time as flux, time as becoming, has almost been ignored. An exception would be Lynch's work on Boston in which he attempts to give spatial cues to notions such as "social time," "group time," "journey time," "celebrating time," "body time" (circadian cycles), and of course, "Boston time." And Lynch appears to hold a 'time as becoming' viewpoint:

> "Space and time modify each other: the idea of a space is built up by a temporal sequence of scenes; time is enriched by cramming it with spatial experience. The camera moves in both dimensions, transforming one into the other and reducing the two to emotional coherence."[16]

The reference to the "camera" is significant -- perhaps one of the only methods which is capable of capturing the dynamic notion of time is that of cinematography.

III. Problems in Temporal Modes of Explanation

If the notions of time are to have any meaning at all in geography, they must first be incorporated into modes of explanation which in some way aid the researcher in formulating statements which can increase the congruence between reality-as-perceived and our statements about that reality. Without digressing into the nature of reality or the problems surrounding the concept of 'perception', there are three or four problem areas in temporal explanation where the notion of time can be considered.

(1) The Form of Explanation. Temporal modes of explanation are probabilistic (as opposed to deterministic or causal) in structure, their form being the outcome of the essentially statistical character of any generalizations about human behavior. As such they are of the form, if A, then probably B, rather than 'A, and only A, produces B, always'. The major weakness of this form of explanation includes the fact that their conclusions are not logically necessary consequences of their premises and therefore the actions historians succeed in explaining could never have been predicted (i.e., deduced) from the information in the premises, even if all this information were available to someone just prior to the event under study.[17] The question of the position and importance of the time factor in this argument may be posed as follows:

> individual X is in conditions C at T1
> most individuals in conditions C would do Y
> therefore X does Y at T2.

At first sight it would appear that the expressions 'T1, T2' are simply reference points on some continuum, the first for affirming that conditions of type C are present, the second for denoting that Y took place. As such, time is simply a static framework for the argument. But suppose a more dynamic approach is postulated: let T1 be infinitely subdivided into n parts.[18] In this situation, do the conditions C hold with the same intensity over all Tn? Is individual X experiencing these conditions in the same manner over all Tn? Is it not possible that during some Tn (say up until Tn-1), individual X could entertain other outcomes to the situation than Y? What would be the outcome if Tn were infinitely short? or infinitely long? It is apparent that even without the answers to these questions, that changing the concept of time to "human time experienced by individual X during conditions C" could profoundly alter the conclusion, e.g., if Tn were very short, the probability of the outcome Y would increase; if Tn were longer, X would have at least the choice of doing Y or not acting at all, and if Tn were very long, then the probability of Y could decrease, presumably as other possible actions (Y1...Yn) were considered, or as the conditions changed (C1...Cn).

(2) The Problem of Sufficient Conditions.[19] If the form of temporal explanations is taken to mean the deducing of some existing conditions from a set of initial conditions and some process law,[20]

then further problems result from considering the types of conditions in this mode of explanation. Nagel points out that historians usually concentrate on detailing the necessary conditions for the occurrence of an event but are "rarely ever in a position to state the sufficient conditions for the occurrence of the events they investigate."[21] This is due either to the fact that what are thought to be necessary conditions are really only 'contingently necessary conditions', i.e., they act as necessary conditions, if and only if, other complementary conditions are fulfilled or it is due to the confusing of necessary for sufficient conditions. Temporal explanations in geography commit the same sins: e.g., "the town of Halifax developed because it had a good harbour (contingently necessary condition); the formation of a ghetto results from the intersection of three 'sets' of conditions: low-incomes, a non-white population, urban settings -- all three are 'necessary' conditions for ghetto formation but none (even in combination) are sufficient (logically)."[22] But for process laws to operate at all, sufficient conditions must be identified,[23] however complicated they may be in terms of human reasons, dispositions and motives. Until this occurs, temporal explanations of this sort will have to be regarded as weaker and considerably looser than the standard deductive-nomological mode of explanation.

(3) 'Genetic' Explanations. A third problem involves the construction of 'genetic' explanations where reference is made to an event progressing through several 'stages in a cycle' or sequences toward some hypothesized outcome. Davis' landscape cycle, Rostow's economic growth theory, Whittlesey's 'sequent-occupance' concept and Broek's cultural stage approach to land use could all be regarded as variants of the genetic mode of explanation. As Harvey points out, time is considered in such approaches as a forcing variable and the appeal is made to our own sense of time passing to verify this assertion. In effect, time is being assessed as a causal agent in a sequence of events, and inevitably, change will take place simply because of the passage of time. The problems resulting from this conception of temporal explanation are manifold. First there is often no mechanism hypothesized in the explanation, we are simply given the stage titles (youth, maturity, old age) and a description of how each stage can be characterized. This amounts to the projection of an a priori model of time (necessary sequence) onto reality itself, something which few researchers would agree is actually the case. Secondly, the existence of the conditions referred to in the explanations are often non-concurrent and they are at best only some of the necessary conditions rather than a full list of the necessary and sufficient conditions, e.g., the conditions of gradient and running water are partial conditions for the Davisian cycle but say nothing about the process of rejuvenation. We are left then in a situation in which,

> "...a genetic explanation of a particular event is in general analyzable into a sequence of probabilistic explanations whose instantial premises (a set of conditions that has already occurred), refer to events that happen at different times rather than concurrently."[24]

IV. Conclusion

"What, then, is time?" St. Augustine's "queer" question has had many attempts at an answer but each one has been superceded by a proof of its fallibility and the generation of more questions concerning the nature of time. The classical notion of time as an absolute entity, something which could be measured by examining the "space traversed" in a given duration, was found to exhibit a very circular type of reasoning: the definition of time depended on the device used to measure time. Kant's solution to this vexing problem was to conceive of two senses of time, one "inner" (subjective time) and the other "outer" (objective time), but this left him with a verification problem for knowledge in the "outer" world. The contemporary notion of time, tied as it is to the speed of transmission of light signals, still poses problems for the conceptualization of "human time," i.e., the lived-time or experienced time of individuals as opposed to the physicists operational metric for time.

In geography, the consequences of the use and misuse of temporal concepts have been:

(i) Whereas the physical notion of time is derived from a posteriori models, the geographer's notion has generally been of an a priori sort with the resulting problem of isomorphism: do the a priori models of time fit the real-world data under investigation? In most cases the answer has been in the negative since the researcher, besides being bound by his own concept of time, is attempting to construct an "objective" time scale for other individuals, each of whom may have a different notion of time depending on his socio-cultural setting.

(ii) Most geographers are still using the "time-as-a fourth dimension" definition, and this notion has been incorporated into existing temporal and genetic types of explanation. At best this conceptualization of time can only offer "snapshot" views of reality and will pose problems in the form and content of explanations which employ such notions. Among the most serious shortcomings of these explanations is the lack of specification of sufficient conditions (for an event to have occurred), conditions which are indispensible for the formation of process laws.

(iii) Dynamic notions of time are conspicuously absent in geography (as in most other social sciences) but attempts are being made to investigate the notion of "lived-time" by segmenting an individual's daily time-budget either according to activity type ("Social time," "journey Time") or according to the emotional attributes of the time experience, e.g., "celebrating time."

FOOTNOTES

[1]Aristotle, Physics, in R. P. Hardie and R. K. Gaye (trans.), W. D. Ross (ed.), The Basic Works of Aristotle (Oxford: 1930), p. 218.

[2]Brian J. L. Berry, "Approaches to Regional Analysis: A Synthesis," Annals, A.A.G. 54 (1964), pp. 2-11.

[3]Kevin Lynch, What Time is This Place? (M.I.T. Press, 1972).

[4]David Harvey, Explanation in Geography (Arnold, 1969).

[5]As quoted in R. M. Gale (ed.), The Philosophy of Time (Anchor, 1967), p. 1.

[6]Immanuel Kant, Critique of Pure Reason, N. K. Smith (trans.) (St. Martins, 1929), p. 77.

[7]J. A. May, Kant's Concept of Geography and its Relation to Recent Geographical Thought (Toronto, 1970), p. 121.

[8]This viewpoint was not entirely pervasive in the discipline. Mas Sorre argues for a balance between the genetic (historical) type of explanation is geography and what he terms the ecological type of explanation (how the same phenomenon appears at the same time in a spatial context). Max Sorre, "The Role of historical explanation in human geography," in P. L. Wagner and M. W. Mikesell (eds.), Readings in Cultural Geography (Chicago, 1962), p. 44.

[9]D. R. Stoddart, "Darwin's impact on geography," Annals, A.A.G. 56 (1966), p. 141.

[10]H. C. Darby, "On the relations of Geography and History," Institute of Birtish Geographers 19 (1953), p. 6.

[11]Even Reichenbach concedes that the concept of time is inseparable from the concept of the self or "ego", "I am" is always equivalent to "I am NOW," but I am in an 'eternal now' and feel myself remaining the same in the elusive current of time." H. Reichenbach, The Philosophy of Space and Time, M. Reichenbach and J. Freund (trans.) (Dover, 1958), p. 110.

[12]H. Bergson, Time and Free Will, F. L. Pogson (trans.) (Harper, 1960), p. 104.

[13]See Gale, op.cit.

[14]B. L. Whorf, "An American Indian Model of the University," in Whorf, Language, Thought and Reality (M.I.T. Press, 1950).

[15]Even the space-time models of Haegerstrand and the so-called "process laws" of Bergmann are restricted by data difficulties and by their very form to "snapshot views" of reality.

[16]Lynch, op.cit., p. 167.

[17]E. Nagel, The Structure of Science (Harcourt, Brace and World, 1961).

[18]An apology should be made for demonstrating a dynamic concept of time using algebraic and integer symbols. To be more exact, the example should be recast in differential and integral calculus.

[19]A useful example to illustrate the difference between necessary and sufficient conditions would be that of the relationships between air, water and mammal life. Air is a necesaary condition for mammal life, i.e., it defines a constraint: "If there were no air, there would be no mammal life." Water is a sufficient condition for mammal life, i.e., it defines a possibility: if water exists, mammal life can exist, but not, "If there were no water, there would be no mammal life."

[20]Harvey, op.cit.

[21]Nagel, op.cit., p. 559.

[22]This type of probabilistic concept of "process" was introduced into geography by Vidal de la Blache.

[23]See H. M. Blalock, Causal Inference in Non-experimental Research (Chapel Hill, 1964), and M. Bunge, Causality: the Place of the Causal Principle in Modern Science (Meridian, 1963).

[24]Nagel, op.cit., p. 568.

Contemporary Trends in Political Geography: A Critical Overview

by NURIT KLIOT

I. Introduction

Among all the fields of Geography, Political Geography has had, and still does have, an inferior status. There are several reasons for this situation. The historical-sociological development of Political Geography had a negative influence. Geopolitics and the extreme environmental determinism which characterized Political Geography until the end of the fifties kept the field in a backward position in relation to the other branches of Geography. In addition, the number of practicing Political Geographers was small, the supply of courses offered in Political Geography was poor, and the quality of teaching meager. As a result, only a few students joined the community of Political Geographers each year. Furthermore, both theoretical and methdological weaknesses typified Political Geography more than any other branch of Geography. Political Geographers were the last to adopt methdological innovations or to develop any clear theoretical notions.

It seems that contemporary Political Geography has succeeded in liberating itself from these limitations. The sixties witnessed a quiet and moderate revolution in the field. This revolution was characterized by five major changes:

(1) Political Geography became more of an interdisciplinary science. The connections between Political Geography and Political Science on the one hand, and Political Geography and the other Social Sciences on the other, were strengthened. Personal and intellectual communication between Political Geographers and other scientists began to develop in professional congresses and in interdepartmental meetings among university professors.

(2) New subjects for study appeared. A large group of election and voting studies is one example of the new wave. Urban-political problems, problems of administrative districts, and the supply of municipal services also became popular among Political Geographers. Of even more interest has been the trend to deal not only with the structure and form of political phenomena, but also with political processes and behavior.

(3) Slight progress was made in the generalized-theoretical level of Political Geography. However, as Cohen has stated, Political Geography is not balanced well between the empirical-inductive and the theoretical-deductive approaches.[1] Political Geography continues to lean heavily toward the empirical-inductive approach.

(4) Methodology also has shown progress. In the process of getting closer to the other disciplines of the Social Sciences, Political Geography acquired new research methods and techniques. The systems approach became one of the main scientific tools for the Political Geographer. Quantitative methods and computer programming were introduced as devices also.

(5) A large step forward has been taken in the educational aspect of Political Geography. First, excellent textbooks and readers appeared. Later, teaching aids such as games were developed, and younger Political Geographers joined the field. As a result, the quality of the work in the field improved.

These five trends became very significant in the seventies. It is the intention of this article to examine in detail the above trends, and to draw some conclusions as to the future development of the field.

II. The Interdisciplinary Character of Political Geography

The development of the interdisciplinary nature of Political Geography has manifested itself both implicitly and explicitly. Implicitly, the definitions of Political Geography became more "Political." The characterization of the field as "the study of the relations between Man's political activity and organizations and the natural environment"[2] has been replaced by the statement that "Political Geography is concerned with politically organized areas, their resources, and the reasons for the particular geographical forms they assume. . .in particular it is concerned with that most significant of all such areas -- the state."[3]

Geographers chose political structures (such as the state) as their unit of analysis. This structural-political definition has been replaced by an even more political definition of the field as "understanding political processes, the geographical factors considered during the making of political decisions, the geographical factors which influence the outcomes of political decisions, and the geographical consequences of political decisions and actions" (Bergman, 1975).

This last definition emphasizes, more than any other, the dynamics of political processes and decisions and their impact on the landscape. It is also interesting to note that in this definition, Bergman treats the geographical variables once as independent ("the geographical factors which influence the outcome of political decisions") and once as dependent (the geographical consequences of political decisions"), recognizing both aspects of the relationship between Geography and Political Science.

Explicitly, Geographers appear to be more "Political" or "Social" Scientists in three ways.

(1) The textbooks and readers include more and more material

which has come directly from either Political Science, Sociology or Economics. Jackson and Samuels (1971) include only eleven selections by Geographers in their reader, compared to twenty selections by Political Scientists. In the excellent text edited by Kasperson and Minghi, sixteen of the forty selections are contributions by Political Scientists. Resource papers in Political Geography (Soja, 1971; Massam, 1972) recommend many sources outside of the geographical discipline. People like K. Boulding, K. Deutsch, L. Krader, T. Parsons and E. Hall are mentioned in almost every textbook. This introduction of the Social and Political Sciences into Political Geography is not artificial; Geographers sincerely try to define the geographical factors in the process of political integration or to establish the geographical dimensions of political conflicts.

(2) Methodologically, as mentioned before, Political Geography has defined itself more clearly than ever before as a Social Science. The systems approach, especially as developed by Political Scientists such as D. Easton and G. Almond has been adopted by Geographers; probabilistic models have been slowly entering the field; and game-theory (i.e., zero-sum game, prisoner's dilemma) has been a new innovation (Muir, 1975). The utilization of the same quantitative research methods as other scientists significantly improved interdisciplinary communications.

(3) The interdisciplinary trend has also appeared in university curricula. Cooperation between Political Geographers and Political Scientists in building course-programs and research has improved. Clark University is a good example of cooperation among scholars from different disciplines and provides the type of academic environment in which a course by the name of "Citizen Participation" can be offered in the Geography Department, and be open to both Geography and Government students. While there has been a slight trend for other disciplines to use geographical concepts (such as the "region") in their studies,[4] Political Geography has still not acquired a respectable position among the other Social Sciences, which neither appreciate nor quote geographical studies.

III. The Subject Matter of Political Geography

Altogether, this paper examines sixty-eight articles and books which appeared in the general field of Political Geography between 1969 and 1976. Table 1 represents how these sixty-eight items are divided among the different subjects with which Political Geographers are concerned. The largest group is that of textbooks and readers. Political Geography gained a great deal from this wave of new books. However, this group does not represent a uniform approach. One subgroup presented a totally new approach to Political Geography (Kasperson and Minghi, 1969; Bergman and Jackson, 1973; Bergman, 1975; Muir, 1975; Jackson and Samuels, 1971), yet other publications continued the older themes (Prescott, 1972; de Blij, 1972; East and Prescott, 1975; James, 1974; Brunn, 1974).

What were the new messages of the innovative group? Kasperson

Table 1

Classification of Contemporary Publications in Political Geography According to Subject (1969-1976)

Subjects	Number of Items
Textbooks and Readers	11
Boundaries and Frontiers	2
Capitals	4
Administrative Systems, Supply of Services, and Public Policy	8
Political Areas	3
Districting, Reapportionment, and Electoral Geography	6
Territoriality	3
Global Perspectives	4
Political Geography of Oceans	2
Political Values, Ideologies, and Landscapes	8
Location of Conflict and Power	3
International Disputes and Conflicts	4
Generalizations and Models	3
Miscellaneous	6
TOTAL	68

and Minghi (1969) introduced a completely new and dynamic approach to Political Geography based on new perspectives: process and behavior. According to the editors, integration, growth and development are important processes for the Political Geographer to study, as are behaviors such as decision making, voting, perception and territoriality. The notions of process and behavior soon appeared as important elements in the works of other Political Geographers (Best, 1970; Gottman, 1973; Cox, 1975).

Samuels and Jackson (1971) provided an excellent introduction of the systems approach to the subject matter of Political Geography, a dynamic approach, which shows how integration and communication could be defined and analyzed as supports for a system, how perception influences our picture of the boundaries of a system, and so on. Bergman (1975) deals with the political organization of space, from the local level to the international system, and is concerned not only with forms and structures of political systems, but also with processes like the integration and disintegration of nations, and nation building.

Finally, Muir (1975) concentrated specifically on the state as a unit of analysis, although he has dedicated a whole chapter to the international system and discusses subjects like imperialism, and international trade, conflicts and disputes. Muir divided his book almost equally between structures (Capitals, core areas, states and boundaries) and processes (perception, decision making, nationalism and revolution), and thus has provided the best integration of old and new themes. In addition, the book is well-balanced between general and case studies. It also supplies another innovation: whenever possible, quantitative methods and devices have been used to help elaborate ideas.

Compared to these four excellent books, the rest are very disappointing. Prescott (1972), after giving a conservative definition of Political Geography, discussed electoral geography, public policy and frontiers and boundaries in great detail. Unfortunately, his discussion of these subjects is also conservative; it tends toward the more static, structural elements rather than the dynamic process/behavioral approach. Brunn (1974) limits his book to the United States. As a description of the American arena the book is excellent, rich in diversified examples, maps and illustrations. However, there are no general concepts to tie together the details. To quote R. Kasperson, the text is not "a breakthrough in the field of Political Geography, nor even a coherent regional Political Geography of the U.S.A."[5] East and Prescott (1975) have released a new book which, however, uses an old approach. Describing the international system in a structural perspective, the authors treat size, shapes, location, frontiers and boundaries, the economic or administrative order, all in a static manners. The behavioral revolution in Political Geography has not touched this book. A good selection of articles has been assembled by de Blij (1972), and the accompanying reading lists are excellent. However, the approach that is expressed in the introductions to each section remains

basically conservative, concerned with structure and form.

A further look at the list of subjects with which geographers have been concerned (Table 1), shows that more than half of the subjects are old: boundaries, capitals, political areas, global perspectives, and international disputes. Interestingly, although the subjects are old, the treatment is often innovative. For example, three different authors write about capitals (Best, 1970; Kearns, 1973; and Cohen, 1975), but only a small proportion of their articles is devoted to the description of structure, form and morphology, and most of their efforts are expended in examining the dynamic process in which a capital is chosen, or the integrative function that a capital can fulfill.

Other groups of articles and books also reflect the new behavioral approach, Cox (1973) has developed a new locational-behavioral model for conflict and power. Voting behavior in Los Angeles (McPhail, 1971), the Southeastern United States (Bushman and Stanely, 1971) and New Zealand (Johnston, 1974) has been examined. A relatively large group of articles deals with administrative systems, public policies, and the supply of services. Stepehnson (1975) looks at the impact of the international monetary sanctions on the internal viability of Rhodesia; Sommers (1971) examines the spatial impact of government decisions on post-war economic change in northern Norway; Christopher (1971) deals with colonial land policy in Natal. The Institute of British Geographers dedicated a whole issue (Volume 63, 1974) of its Transactions to the subject of Geography and Public Policy.

The most interesting group of articles is the one on political values, ideologies and landscapes. Geographers appear to have developed a strong interest in the relationship between political ideologies and values and the political landscapes that result from a particular political system. Ginsberg (1973) has analyzed the impact of colonialism on the development of newly independent states; McCall (1969, 1973) introduced the concept of the insurgent or revolutionary state, as it developed in Asia; Salisbury (1971) has compared the black ghetto to an insurgent state -- an island of riots, bitterness, and anti-establishment feeling. Dikshit (1971) deals with the spatial consequences of federalism, and the failure of federalism in Central Africa. Haas (1970-1971) describes the independence movements in the South Pacific, and their influence on the landscape.

Finally, there is a group of articles that eludes categorization. Holmes and Douglass (1973) see the desegregation of city schools as an exercise in teaching Political Geography. Brunn (1973) has taken a futuristic look at the United States in the year 2000, and suggested six major developments: the emergence of a city-oriented state; the rise of a new welfare, political structure; the erosion of internal boundaries; new electoral patterns based on regional philosophy; the centralization of government planning; and the politicalization of the environment. Kory (1972) deals with the

political significance of population, especially that of ethnic, economic and social homogeneity and its influence on voting patterns.

In general, the reviewed material represented work in Political Geography at all scales of analysis. Four of the texts (Jackson and Samuels, 1971; Bergman and Jackson, 1973; Bergman, 1975; Muir, 1975) include studies of localities (either a village or city), regions, states and the international arena. Of the other publications, ten take the city as their unit of analysis, forty-five use the nation state, and ten discuss the global scale of events. As in the past, the state remains the most popular unit of analysis in Political Geography.

IV. The Empirical vs. the Theoretical

It was mentioned in the Introduction that Political Geographers tend to deal with the empirical and neglect the theoretical. This was true in the past and remains the case, although there has been some progress. There is not a single theoretical statement in Political Geography, although there are a few paradigmatic statements, models, generalizations and assumptions on which Political Geographers base their work.

According to Amedeo and Golledge (1975) there are four current themes in Geography in general:

(1) Hypotheses formulated according to the areal or spatial association theme ask the question, "What accounts for the pattern of distribution A?" The reasoning associates the spatial variance of A with the variance of some other pattern that is functionally or causally related.

(2) A second theme attempts to link generating processes with the forms of spatial distributions. If a process with strong spatial implications generates a pattern in some study area, it is possible to infer the type of pattern that will be generated in that area at a particular time, when the nature of the process is well known.

(3) The spatial interaction theme provides the basis for many geographic hypotheses concerned with accounting for flows among events. Two assumptions furnish the basis for this approach. Individuals, in the process of acting in space, tend to minimize the effort involved in overcoming spatial friction. At the same time, places exhibit a force of attraction directly proportional to the complexity and number of problem-relevant activities associated with them.

(4) Distance decay provides another major structural theme for a variety of geographic hypotheses. The effect of an event or activity is seen to decrease with increasing distance from the location of its occurance.

An examination of the recent literature reveals that Political Geographers deal with problems along these thematic lines. Many examples of the spatial association approach exist. Dikshit (1971) states that federalism appears when there exists in a state regional differences and regional populations with the power to demand and acquire social accounts for those differences. Similarly, Raitz (1971) concluded that tobacco production in Wisconson is a product of government planting restrictions, which allot acreage to tobacco and maintain production in marginal land. Political factors are considered to be solely responsible for the development of the watch industry in the Virgin Islands (Oxtoby, 1970).

The theme which connects processes to spatial patterns has also attracted a large group of Political Geographers. Haas (1970-71) has analyzed the independence movements in the Pacific Islands and has found that the process of colonization was the strongest force in shaping the region, and that it continues to interfere with self-determination tendencies. Salisbury (1972) describes the Israeli-Syrian demilitarized zone as a product of a long process of development -- war, armistice and delimitation -- until the present pattern was shaped. Barnett and Mercer (1973) regard the pattern (distribution) of public goods as a response to demands made by individuals and interest groups upon the public economy of local government units. They identify allocational and locational processes, which produce the quantity and quality of goods and services.

The spatial interaction theme is commonly found to be useful to the work of Political Geographers, particularly those who are interested in the viability of a state, the state-idea (or iconography of a state) or the ideology of certain states. Haupert (1971) describes the line of actions which led to the reunification of eastern and western Jerusalem after the 1967 war. Holmes and Link (1973) take the problem of city school desegregation as a good learning experience for students, who can discuss the boundaries of school districts, and the influence of factors like road networks and population shifts on educational systems. In describing political fragmentation in the Caribbean, Clarke (1971) identifies patterns of interaction (or disinteraction) influenced not only by real differences, but by imagined differences as well.

The distance decay theme is seldom used by Political Geographers, although Johnson (1974), in his study of local elections, concluded that most local information is passed from person to person, and that as a result, information flows display distance biases.

In general, it seems that although there are not strong paradigms that are accepted by all Political Geographers, there are theoretical themes, which are also common to other fields in geography. Harvey (1969) classifies theoretical concepts into two groups: derivative concepts which have been taken from other disciplines, and indigenous concepts which were developed by geographers. Derivative concepts in Political Geography have come from Economics, Political Science, Psychology and Sociology.

Economics has given Political Geography the concepts of "homo economicus," friction of space, localized costs and benefits, supply and demand, and external effects, among others. Cox (1973), in his description of urban conflicts over public service supply, characterized a situation in which "homo economicus" and business firms will determine the allocation-location pattern of public goods. Hudson[6] uses Central Place theory to explain apportionment. Most work on urban services supply uses economic concepts. Barnett and Mercez 91973) deal with allocational and locational decisions. Massam (1975), in a very detailed volume, with a mainly geometric analysis, supplies an economic paradigm for organizing administrative units, which includes concepts like economy of scale, distance decay and Pareto optimality.

Another important influence on Political Geography has been Political Science, although sometimes it is difficult to determine exactly when a concept has its origins in political theory and when it is geographical. In two subjects, electoral geography, and frontiers and boundaries, this distinction is especially difficult to make. Research in these fields requires a broad knowledge of either election theory or the accepted paradigms of international law. Other political concepts have been adopted for geographical use. Dacey[7] uses a model of political integration to analyze a case study in Peru. Political concepts of "friends and neighbors voting," political elites and models of political decision making are used by Brunn (1974). Muir (1975) introduced the political theories of nationalism, national character and imperialism. In general, the vocabulary of Political Geographers has political origins.

Psychology has contributed to Political Geography the concepts of environmental perception (Brunn 1974, Muir 1975), and has also had a major part in the development of the concept of territoriality. Schofer (1975) bases his work on territoriality on concepts developed by Sociologists and Psychologists like Hall, Sommer and Ardrey. He defines the processes of identification, exclusiveness and zonation as the major forces in the determination of territorial space. In fact, Political Geographers, in establishing one of the most important concepts in the field, territoriality, have depended on the work of Psychologists, Sociologists and even Biologists.

While contributions from other fields have obviously been important, Political Geography has evolved indigenous theoretical constructs, the most important of which has been the political region. Geographers like Hartshorne and Whittlesey developed the idea of the political-functional region as a core area. Cohen (1973) looks at the international system from the regional-political perspective, and defines geostrategic and geopolitical regions according to their socio-economic and political power; he continues along these lines by developing the concept of a "new second order of powers" (Cohen, 1975).

In summarizing the principal theoretical-empirical trends in Political Geography, it is possible to say the strong side of the

Political Geographer is the empirical one, as demonstrated by the abundance of case studies. On the other hand, not a single, sound theory is generally accepted among Political Geographers. There exist at present only common themes and concepts, partially derived from other fields, and partially developed by geographers themselves.

V. Methodology in Political Geography

One area of major progress in Political Geography has been methodology. The first advance was the general adoption of the systems approach. While Kasperson and Minghi (1969) pay almost no attention to methodology, Jackson and Samuels (1971) dedicate much of their book to a thorough discussion of the relevance to Political Geography of systems, through which "Political Geographers and Political Scientists may more clearly recognize their common concern -- a concern that revolves about human beings interacting to form, institutionalize and change their political systems."[8] In their introduction they define the political system and its functions, structure, limits, supports, impact and -- most importantly -- its utility to geographical investigation.

de Blij (1973) also terms his approach "systematic Political Geography," but there is no clear and coherent systematic appearance to his book, although a few of the selections are representative of this methodology. Jackson and Bergman (1973) are more successful, describing the organization of political territory as a system, and attempting to show that Hartshorne's functional approach, Jones' unified field theory, and Gottmann and other Political Geographers' work have implicitly utilized systems in the past. They also carefully define the dimensions of a system and its elements. Bergman (1973) has developed the system furthest in Political Geography. He applies the concept of the system to every level of territory, from the micro-level to the international scale, and defines the functions (goal attainment, pattern maintenance, integration and adaptation) of political systems in their geographical perspective. His book represents the best systems approach in Political Geography. The only model based on systems that has been developed by Political Geographers is that of Cohen and Rosenthal (1971). While their description of the political system does not differ from those of Political Scientists, they concentrate on the spatial dimensions of political systems (political areas, territoriality, political landscapes, etc.). They then apply their model to Venezuela.

Other new developments are the adoption of quantitative methods and computer techniques, and while these approaches have been common to other Social Sciences in the past, their use in Political Geography has raised the level of sophistication and scientific reasoning in the field. Most Political Geographers still use very simple measures to quantification, percentages, ratios and averages. Only seldom are more elaborate measures (like correlations) incorporated. One exception is Johnson's (1974) analysis of voting decisions in Christchurch, New Zealand. In order to isolate the local

effect on election results, he uses two regression models. In general, this article has a scientific form; it has hypotheses, defined variables, accurate calculations, and a careful methodology.

McCall (1975) has tried (not very successfully) to describe the relationships of power to other components. His equation is:

$$\text{Success of Power} = \frac{F + P}{O + T} \times I$$

where: F = Force
P = People
O = Organization
T = Territory
I = Imagination

While according to McCall, these are the most important factors in the success of insurgent states in Asia, it is difficult to see the validity of such an equation for further investigation.

Massam (1975) has used a very quantitative approach, utilizing geometry to measure the shapes of administrative systems, supply and demand curves to describe the costs of services, and different equations to measure distances and distributions of administrative systems. Muir (1975) has assembled a variety of statistical and mathematical devices that can be used efficiently by Political Geographers. He begins with a simple index of the eccentricity of capital cities:

$$I = \frac{\text{distance CA}}{r} \times 100$$

where: A = actual capital of a state
C = center of gravity
r = average length of at least eight equally spaced radials measured from C to the state boundaries

Muir also offers a shape index for territories, matricies for games, an equation for the calculation of ethnic differentiation in a certain state, indices of segregation and dissimilarity, a measure of transactions between states, the Spearman Correlation Coefficient, and more. All these are accompanied by simple instructions for calculation. To date, this is clearly the best collection of quantitative techniques useful to the Political Geographer.

VI. Summary

Contemporary Political Geography is most concerned with three areas of study: (1) the spatial components of phenomena (their location and distribution); (2) the spatial behavior of phenomena (i.e., integration, viability, territoriality); and (3) spatial structures as hierarchical, administrative systems. Current trends in the field stress the interdisciplinary approach in all aspects of study, from

methodological techniques to theoretical concepts. Political Geography today is more "scientific" in its language and methodology, although it still lags behind the other Social Sciences. Contemporary studies are more often based on theoretical assumptions, and often conclude in generalizations. Yet, the field of Political Geography, as a whole, continues to be weak structurally due to the imbalance that exists between the mass of empirical studies and the scarcity of theoretical work.

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FOOTNOTES

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The Economics of Solar Energy: A Report on the NSF-Clark Solar Energy Grant

by ROBERT M. WIRTSHAFTER, ELIOT J. WESSLER

The concern for dwindling energy resources, increasing pollution, the potential nuclear hazard and rising electricity and fuel rates, has brought increasing attention to solar heating and cooling (space conditioning) as a panacea. Advantages to the use of solar energy include the seemingly unlimited supply and low environmental costs. Solar energy use, however, is not without problems. Depending upon system design, it may be undependable under adverse weather conditions (such as a sequence of several cloudy days) which would necessitate the inclusion of a back-up system. Due to the relatively low capital costs of electric resistance heating equipment, and the unavailability of alternatives for cooling, many present and future solar buildings will use electricity for the back-up system. Economic feasibility studies of solar energy, therefore, should include an examination of the effects of solar energy use on electric utility planning. In fact, a true measure of solar's economic efficiency must include the calculation of all costs incurred to produce space conditioning via solar energy in comparison to all costs incurred by the use of any alternate system.

Previous studies of solar energy's economic feasibility have, in general, computed average annual performance of a solar building. This value is then used as the determinant of cost-effectiveness for the adoption of solar energy. The annual amortized capital costs of the solar system plus auxiliary fuel cost is then compared to the alternatives to solar. This method, however, ignores many important factors which will alter the total expenses incurred by either a solar or alternate heating and cooling source.

The National Science Foundation this year awarded Clark University a $140,000 grant to study the interface between solar energy construction and utility load management. Total Environmental Action, (TEA) Harrisville, New Hampshire is principal subcontractor to the project. The co-principal investigators are Assistant Professor Stephen L. Feldman of Clark, and Bruce Anderson, President of TEA. This project is one of the most comprehensive analyses of the economic efficiency of national energy and resource consumption. The ways in which solar energy use will relate to future energy use patterns is examined.

Utility companies' costs are determined by the magnitude of the peak demand experienced and the load factor. The coincident peak, (i.e., the single highest amount of electricity demanded) determines the capacity requirements of the utility. The load factor, the ratio of average load to the peak load, determines how efficiently capital resources are being utilized. A high load factor means that more efficient generation facilities (base load

coal and nuclear) are used a greater percentage of the time. This results in lower generation costs for the utility and lower electric rates for the consumer.

The computation of the true costs of supplying auxiliary energy to solar buildings requires knowledge of the effect of auxiliary use on both coincident peak and load factor, and the associated costs of these effects. These true costs are reflected in the calculation of the costs of the increment in capacity required to supply the demand, and the fuel costs of generating that demand. The average cost rate of electric utilities (i.e., total costs/total demand, expressed in $/kwh) is inadequate in computing the overall costs of electric generation. The fact is that generation costs vary as demand varies. The differential in peak/off peak costs has become so great for some utilities that rates which reflect the marginal cost of production will probably be adopted by them in the immediate future. These marginal cost rates are desirable because they minimize costs and manage load factors for the utility, and conserve energy. In addition, they are more economically efficient and equitable since charges to consumers reflect the actual costs of producing electricity.

The performance of solar buildings must therefore be evaluated in terms of the temporal nature of the use of auxiliary energy. For example, a solar energy system which provides 100% of the space conditioning load of the building would have no adverse impact on the utility. Such a building, however, is certainly not cost-effective to the building owner. On the other hand, a system which provides less than 100% of the space conditioning load of the building but where auxiliary energy needs of the building are coincident with the times that the utility experiences its peak demand may have a maximum of adverse impact on the utility, despite the fact that the design may be cost-effective for the building owner.

The above two cases demonstrate the range of impacts to the building owner and utility sectors. Such analyses are, however, incomplete because they do not consider overall public welfare. A welfare maximum solution would be one in which resource conservation is maximized and total costs are minimized. In the case of solar energy construction therefore, welfare is maximized when the long run incremental costs of the solar energy system is less than the long run incremental costs of the utility's generating capacity that the solar system replaces.

This project seeks to identify optimal solar energy building designs in each of fifteen climatic regions which represent electric utilities for which extensive operations data has been collected. The efficacy of these solar energy designs under present and theoretical marginal cost rate schedules will be assessed. Final project recommendations will include design strategies for optimal solar energy construction and utility load management.

Methods of Reducing Peak Water Demand

by DAVID MAGID

Clark University has received a National Science Foundation research grant of $147,100. to study methods of reducing peak water demands. The principal investigator of the study is Dr. Stepehn L. Feldman, Assistant Professor, in the Graduate School of Geography.

Public water utilities are presently experiencing difficulties in the management of urban water supplies due to the unavailability and costly development of remaining water resources. In addition, the demand for water during periods of peak use is rising. In order to alleviate these difficulties, a more efficient utilization of existing resources is necessary. This is possible through utility implementation of an effective load management program, the goal of which is the mitigation of peak demands and thus the avoidance of excessive and costly system expansion. The researchers will investigate technological and policy methods to mitigate the peak demands.

The major objective of our project is to study the effect time of day pricing has on residential water demand and system load. Marginal cost prices will be established on a peak demand/off-peak demand basis, with the price of water during the daily peak hours to be higher than the off-peak hours price. The rationale for this is that during periods of peak demand additional system capacity, that otherwise would not be necessary, is required to adequately supply water. The cost of such additional capacity should be passed on to those consumers contributing and responsible for the peak demand periods. One conceivable effect of such a pricing scheme is the reduction of demand during peak periods, obviating the need for immediate system expansions and thus decreasing long run capital investments.

In order to study the effects of time of day pricing on residential water consumption, an experimental group of 100 households in two cities, Phoenix, Arizona and Washington, D.C., will be studied for a period of nine months beginning in January, 1977. Selected on a random basis, household participation will be voluntary. After a series of initial interviews with the head of each household, a load meter, recording consumption at periodic intervals, will be installed for each household.

Analysis of the data will (1) enable a direct evaluation of the socio-economic impacts of time of day pricing in the two metered cities, and (2) provide the basis for the development of a load management model that will be used to simulate the effects of marginal cost time of day pricing. The impact of marginal cost pricing will then be evaluated in a group of cities, possibly Denver, Tucson, Miami, Oakland, San Diego, and Worcester, using this model.

Progress in Project RARE

by JERRY BERK

During the past year Project RARE (Risk Assessment of Rare Events) has completed several manuscripts encompassing a multidisciplinary perspective of the societal response to nuclear energy. They include the following:

(1) Christoph Hohenemser, "Assessing the Risks of the Nuclear Fuel Cycle," in Marwah and Schultz, eds., Nuclear Proliferation and the Near Nuclear Countries (pp. 85-110), Cambridge, Mass., Ballinger Publishing Co., 1975.

(2) Christoph Hohenemser, Roger Kasperson, and Robert Kates, "The Public Distrust of Nuclear Energy."

(3) Roger Kasperson, Ian Burton, Kenneth Guy, Christoph Hohenemser, Ann Whyte, and James Wood, "Societal Response to the Catastrophic Hazards of Nuclear Energy for Electricity Generation."

(4) Roger Kasperson, Gerald Berk, David Pijawka, Alan Sharaf, and James Wood, "Nuclear Energy, Local Conflict, and Public Oppositions."

In addition to the above manuscripts, Project RARE has recently attempted to add to the growing, but insufficient body of literature on public attitudes toward nuclear energy. Analysis of the results from a questionnaire administered to 250 people "on the street" in Boston, awaits comparative results from Toronto, London, and possibly Tel Aviv.

While the questionnaire does recapitulate some of the basic areas probed by Harris and others, it also makes some unique additions. For example, the RARE survey includes a set of questions which probes the public's perception of nuclear risks, as compared to other energy sources and general personal risks; a quick but comprehensive scale of the respondent's knowledge of nuclear energy; and a measure of whether or not the respondent has changed his attitude on the safety of nuclear power for electricity production.

Preliminary analysis suggests some evidence to support previous findings, such as the stable 65 percent for and 35 percent against nuclear energy, but also suggest several inferences contradictory to other findings and hypotheses. For example: (a) while there appears to be a somewhat stable split between the numbers of people in favor of and opposed to nuclear energy in the aggregate, there seems to be a good deal of attitude shifting within these

groups; (b) those people with higher knowledge, especially women, seem to be more opposed to nuclear energy. This finding differs significantly from the proposition that people fear nuclear power mostly due to ignorance.

In addition to the tri-city expansion of the study, the questionnaire has been lengthened in order to provide a more in depth analysis of the attitudes and perceptions of people living in the vicinity of an existing or proposed nuclear reactor. Three sites were chosen for the administration of one hundred sample questionnaires: the Indian Point reactor in Buchanan, New York; the Millstone reactor in Waterford, Connecticut, and Seabrook, New Hampshire (a site where reactor construction is just beginning).

To the original questionnaire has been added a section on people's perception of living near a nuclear power plant, and a detailed section on general political participation, participation in environmental issues, and participation in the nuclear issue.

Desertification Project

The severe drought conditions affecting large sections of the African continent in the 1970's have provoked widespread concern about the apparent development, on a global scale, of increasingly desert-like conditions in the fringes of the earth's arid zones. The United Nations General Assembly in Resolution 3337 (XXIX), "International Co-operation to Combat Desertification," has focused attention on the need to understand the process of desertification and devise an action program that can cope with it. To accomplish this purpose, UNEP has organized a series of studies to provide background material for a conference on desertification to be held in 1977. A research group, centered at Clark University's Program in International Development and Social Change and led by Robert W. Kates and Douglas L. Johnson, will undertake a study of the demographic, socio-economic and behavioral aspects of desertification as part of this program. Studies of ecological change, climate, and desert technological change are also part of the preparation effort; they will be organized by other authors and based at other institutions.

In very general terms we view desertification as the process of impoverishment of arid, semi-arid, and some subhumid ecosystems. Our emphasis is on the process of change in these ecosystems. These changes are ones that can be measured by reduced productivity of desirable plants, alterations in the biomass and diversity of micro and macro fauna, accelerated soil deterioration, and increased difficulties for human life support systems. We see this change as the result of the interaction of three major sets of factors operating either singly or in combination. These factors are: (1) possible secular alteration of climatic systems on a global or regional scale; (2) the adverse impact of human activities; and (3) the collapse of overstressed ecological systems under a combination of human pressure and meteorological drought. On a time scale significant to present populations, the results of desertification are a lower carrying capacity for animals, a reduction in crop production potential, an increase in environmental deterioration due to water and wind erosion, and the ensuing alteration, usually adverse, in local livelihood systems. In pursuing the demographic, socio-economic and behavioral aspects of desertification, our concern is primarily, although not exclusively, with the human side of this interactive equation.

We perceive four major trends which serve as initial hypotheses, the general applicability of which remains to be demonstrated.

(1) Demographically, regions experiencing desertification can anticipate further population growth. This holds true for both developing and industrialized nations. For the former, the full impact of declining death rates is yet to be experienced, while the arid regions of the wealthy nations have higher growth rates due to attractive climate and amenities that favored immigration. Thus, to the extent that demographic pressure exacerbates desertification, a worsening of present conditions can be anticipated.

(2) The vulnerability of socio-economic systems to drought and desertification is increasing in the developing world. The health and socio-economic impact of natural events of a given magnitude become more severe over time as the vulnerability of systems increase. In industrialized countries, a short-term vulnerability appears to be decreasing at some increase in catastrophic potential.

(3) In terms of human behavior, indigenous livelihood systems are in retreat as isolation breaks down and the competing influences of exogenous technology and social organization and the internal pressures of population growth and ecological change take effect. Paradoxically, the loss of these systems comes at a time when there is growing recognition of their inherent rationality and ecological wisdom.

(4) While generally semi-arid lands are viewed as marginal and of low productivity, on a global scale they have functioned as net exporters of population, minerals, animals and agricultural produce.

These trends imply that the seriousness of the problem will grow. They also suggest that there is a need to support existing social systems in order to make them less vulnerable. The techniques for this can be inspired by study of the principles of indigenous livelihood systems.

Abstracts of Dissertation Proposals Accepted 1975-76

Movement, Rest, and Encounter: A Phenomenological Exploration of Some Taken-for-Granted Dimensions of Everyday Environmental Experience

David Seamon

The proposed dissertation seeks to phenomenologically explore through the use of an environmental experience group some taken-for-granted dimensions of everyday environmental experience, which is defined here as the sum total of our firsthand involvements with the everyday spaces, places, and environments in which we find ourselves. The dissertation does not seek an exhaustive listing of these involvements, but a generalized description which portrays their essential core. Because the dissertation proceeds phenomenologically, it provides no hypotheses as to the nature of this essential core; instead, the belief is that this core will reveal itself in its own time through the efforts of the environmental experience group.

Drought-Related Migration in the Maradi-Zinder Area of Niger

David J. Campbell

The recent Sahelian drought has disrupted the socio-economic and environmental conditions in the affected countries. The consequences of this disruption may be felt long into the future. One major change occurred in the distribution of population as thousands of people fled to food distribution centers and areas offering pasture for their herds, in order to avoid starvation in their home areas. While much has been written on the subject of migration in West Africa, little attention has been paid either to the impact of migration on the interior nations or to the phenomenon of migration under stressful conditions. This study will describe and analyze drought-related migration in the Maradi-Zinder area of Niger. It will be based upon a questionnaire survey of refugees already conducted in the area by IDEP. The study will provide insights into the migration of people under drought conditions which will aid planners in developing strategies to better cope with the effects of drought in the future.

An Evaluation of Technologies, Risks, and Decision-Making in Solid Waste Management

Esther Rolnitzky Bowring

The municipal solid waste manager must use his knowledge of present problems and technological options to devise a management plan which will be operative for ten to fifty years in the future. The available technological options have recently increased to include a number of high technology systems. These complex technologies requiring huge investments and large plants due to economies of scale, although superior in their ability to use waste as a resource, may not be as flexible in accommodating future changes as the low technologies (landfill, dumping, and ocean barging) have been. The first hypothesis then, is that some solid waste technologies are more flexible than others and more easily adapted to change, but these technologies vary in their susceptibility to other risks, especially environmental ones. These future changes that may occur involve risk (probability of occurrence can be identified) and uncertainty (probability of occurrence cannot be identified) in such areas as:

(1) technological changes and developments
(2) changing social values and institutions
(3) political and legal changes
(4) economic changes
(5) environmental awareness and restrictions

The second hypothesis states that this type of risk and uncertainty is not taken into account in solid waste management decision-making.

Local Citizen Opposition to Nuclear Power Plants and Oil Refineries

Alan B. Sharaf

Rising citizen interest in achieving a quality environment has frequently taken the form of opposition to such projects as the SST and the nuclear fast breeder reactor. In this study, local citizen opposition to nuclear power plants and oil refineries will be examined. The benefit/cost/risk calculations performed by opponents of these facilities will be analyzed. By examining a number of cases, an understanding of the dynamics of these conflicts will be achieved. Strategies of conflict resolution will be proposed as a result of this investigation.

Abstracts of Masters Theses in Environmental Affairs

The Gateway Compact -- An Analysis of Regional Action

Beverly Cofrancesco

This study traces the nine year chronology starting in 1965 with Senator Abraham Ribicoff's proposal that a National Park for recreation be created along the lower Connecticut River, and ending in 1974 with the institution of a state-local compact for riverway preservation. The paper evaluates the question of why the federal proposal was rejected and how the state-local compact developed and was accepted. The paper isolates the factors which emerged from the research (interviews, newspaper search, attendance at local meetings) as responsible for local opposition to the federal plan and mass recreation and the clamor for state-local control of a purely conservation-oriented program to protect the riverway. In addition, the study evaluates the effectiveness of the Gateway Compact to date and offers some speculations on its chances of survival in the future. In conclusion, the paper points to those events and characteristics specific to the Gateway region and proceedings and therefore "non-exportable," but more importantly draws out certain general statements from the Gateway case that can be synthesized to form a model for citizen participation in conservation planning.

Non-Point Source Pollution: An Investigation of Excess Sedimentation Caused by Construction of Highway I-190 in Leominster, Massachusetts

A. Lawrence Polese, Jr.

When sedimentation occurs in amounts greater than what is generated under natural conditions, the imbalance often results in impairment, degradation, or destruction of natural resources. The investigation here focuses on a specific problem, that is excess sedimentation due to highway construction. It attempts to solve this problem by examining the methods used to control sedimentation, estimating its magnitude, and recommending alternative abatement plans.

Samuel Van Valkenburg (1891-1976)

On April 18, 1976, Samuel Van Valkenburg passed away. Dr. Van was Clark Geography to a generation of distinguished Clark geographers. Whatever the School is today, is very much a product of the strength and tradition that he gave to it over four decades as teacher and leader. Dr. Van was a giant among his peers -- in vigor, intellect, physical stature, and strength of character. For those who knew him and for those who were not fortunate enough to know Samuel Van Valkenburg, the following statement is presented. It was prepared by William A. Koelsch on April 17, 1971 on the occasion of the 50th Anniversary of the Graduate School of Geography and the award to him of a Doctorate of Laws (honoris causa). It reflects only in small measure the love and esteem in which we all held Dr. Van.

"We meet today to recognize a half-century of achievement in geography at Clark University. It is, therefore, appropriate that we recognize a teacher, scholar, colleague and friend whose associations with the leadership of the Graduate School of Geography link us to the first hopeful decade of the department whose traditions we commemorate, and who is himself an important part of those traditions. Dr. Samuel Van Valkenburg came to Clark as a Visiting Professor in 1927 after study in the Universities of Utrecht, Zurich, Berlin, Neuchatel and Lausanne and a professional career as head of Geographical Department of the Royal Survey of the then Dutch East Indies. Upon his return to Clark in 1932 after a three-year absence he was hailed by The Monadnock as 'one of the most popular instructors the Clark campus has ever known', and he retained his rights to those laurels until his formal retirement in 1962. In the interim he had become a leading student of political geography and a recognized authority on the Geography of Europe, in addition to his earlier standing in climatology and the Geography of the Far East. In 1946, upon the retirement of President Atwood, he became Director of the Graduate School of Geography, with the immediate task of building a new faculty and facing the postwar flood of graduate students. Then he took on the task of shepherding the department through the difficult years of the 1950's when salaries were low and fellowships were lean -- managing all the while to maintain an academic environment where good teaching was cherished, research was forwarded, and the human values of graduate education preserved. We stand in his debt today for his loyalty and service to Clark and to geography.

"Dr. Van's research has ranged from the pre-glacial surfaces of the Alps to estimates of the future of the European Common Market. His contributions to the teaching of geography have included several widely used college texts, active support of the improvement of teaching at the secondary level, and his own presence in the classroom, which has stimulated the geographical interests of hundreds of students including three members of the present geography faculty. He has been personally concerned with the application of geographical knowledge and techniques to international cooperation, most notably through the World Land Use Survey, originally proposed by him at the International Geographical Union meetings in Lisbon

in 1949. For fifty years he has criss-crossed the globe, supping with peasant and with king, a genuine cosmopolitan who retains the high culture -- and the accent -- of his native Netherlands.

"Four decades ago it was said of Professor Van Valkenburg that 'he comes to Clark with the interest of the School at heart, and admirably fitted in training, experience and ability for the work he has undertaken here'. It was a prescient statement, but incomplete. We recognize his merits today not simply because he has long had the interest of the School at heart, but because he has been in some sense the heart of the School, and has found a permanent place in the hearts of those who have studied here . . . "

He continued his association with the School by teaching one course each year until 1974.

Alumni News

ADKINSON, BURTON W. (PhD 42) is retired. He has a book in press, Two Centuries of Federal Information, and articles prepared and accepted for the Encyclopedia of Library and Information Science. He is preparing additional articles.

ALEXANDER, LEWIS M. (MA 48, PhD 49), Professor and Chairman, Department of Geography, University of Rhode Island and Director, Master of Marine Affairs Program. He continues to serve as a consultant to the U.S Department of State, and as an advisor to the U.S. Law of the Sea Delegation. He recently published a revision of The Northeastern United States (Van Nostrand New Searchlight Series), and prepared a report on Marine Science Affairs for the NSF's International Decade of Ocean Exploration. He is also active on the National Resource Council's Ocean Policy Committee. He notes that the University of Rhode Island is about to merge the Geography Department with the Master of Marine Affairs Program into a new Geography and Marine Affairs Department with an undergraduate major and Masters Degrees in both Geography and Marine Affairs.

ALLEN, AGNES M. (MA 34, PhD 37), Professor Emeritus, Northern Arizona University, received the Department of the Interior "Conservation Service" award in December 1975, and was elected "Citizen of the Year" for Flagstaff, by the local Daily Sun. She serves on the County Council on Aging and is Chairman of the City Commission on aging.

AMES, DAVID L. (PhD 49), is Associate Dean, School of Community Services, Virginia Commonwealth University, Richmond, Virginia.

ANDERSON, JEREMY (faculty 66-71), Chairman and Professor, Geography Department, Eastern Washington State College, Cheny, Washington. He spent Spring 1975 in Guadalajara, Mexico, where he taught for the Northwest Council of Colleges Program. While there, he climbed to 16,000 feet on Popocateptl one weekend, and spent ten days in Michoacan replicating a portion of Dan Stanislawski's study of town morphology. In September he became coordinator of Social Science Teacher Education for the College and in April of this year he also assumed the Chairmanship of the Geography Department. He writes, "I'm busy." Research in progress: "Landscape Modification as an indication of Social well-being."

ATWOOD, WALLACE W., JR. (MA 27, PhD 30), is retired. He writes, "My retirement years so far have been busy ones. More time for reading and writing, but my chief activity has been consulting. The most recent assignment is with the National Academy of Sciences, where I served prior to retirement. And of course, six grandchildren keep me jumping."

BERMAN, MILDRED (MA 50, PhD 63), is Professor of Geography, Salem State College, Salem, Massachusetts.

BIRCH, WILLIAM (visiting professor, 60-63), is Director of Bristol Polytechnic. He is also currently President of the Institute of British Geographers.

BLOMFIELD, CARL J. (MA 34) and GERTRUDE E. (MA 34), are both retired. They moved in June 1976 to a new home in Sterling Heights, Michigan. Last fall they travelled to Spain, Morroco, the Canary Isles and Portugal.

BOSOWSKI, ELAINE (BA 72, MA 74), is currently ABD at the University of Colorado, Boulder. She writes, "I recently started a Graphics business that is beginning to gain a strong foothold here in Colorado. Hope to put time in on the ol' dissertation in part this summer and next year. Most things these days must be taken as they come. . .and much is happening. By the way, anyone passing through Colorado is most welcome to share our home -- the only "Bosowski" in the Denver telephone book. So come on along."

BOTTS, ADELBERT (MA 31, PhD 34), is retired. He notes, "We are both (Donna and I) active in our local art club and produce a number of oils and water colors each year. I also collect and polish some rocks -- days are too short for all we try to do. Summering in Minnesota and wintering in Texas makes a very pleasant arrangement -- with interesting side trips enroute from one to the other."

BRIERLY, WILLIAM B. (AB 34, AM 36, PhD 42), was retired from the U.S. Government, 31 December 1974. He was Chief, Environmental Criteria Branch, Engineer Topographic Labs, Ft. Belvair, Virginia. He is still an Environmental Consultant to the Department of Defense on Environmental Design Criteria. He is presently preparing papers on the Effects of Climate on the performance of military equipment, and Recommendations for U.S. Government Policies with respect to Environmental Testing. He took part as a panel member in the Institute of Environmental Sciences Symposium on MIL STD 810 C Environmental Test Methods published by the I.E.S. in April 1976.

BRODEUR, DAVID DALLIN (MA 60, PhD 63), Principal Planning Officer, State Planning Authority, South Australia. In November 1975, the last of four studies that he has published on the historic condition of Israel, entitled "Auschwitz Gas: Medical and Chemical Origins," appeared in the English quarterly Faith & Thought. He writes, "From the above you can see that I am more of an historian than a geographer, but my doctoral dissertation, on the historical geography of the New England town commons and greens, was the first step in that natural inclination."

BURRILL, MEREDITH F. (MA 26, PhD 30), Expert on Geographical Names, Office of the Geographer, Department of State, part-time. He will continue to chair the United Nations Group of Experts on Geographical Names through the Third UN Conference on Standardization of Geographical Names in Athens in the summer of 1977. He will participate in the International Geographical Congress in Moscow, July-August 1976, as a member of the Commission on Geographical Terminology.

BUZZARD, ROBERT GUY (PhD 25), is retired. In June 1972 he received the degree of Doctor of Humane Letters from Illinois State University, and in May 1974 received the honorary degree of Doctor of Laws from Eastern Illinois University. He notes that, "This is the sort of thing that sometimes comes to a man when he wanders off into administrative education." He was the founder of Alpha Chapter, Gamma Theta Upsilon, national departmental fraternity in Geography, now an International professional fraternity and the only professional organization with a National Loan Fund which in 1973 had over $70,000 in its treasury. Gamma Theta Upsilon now awards two cash scholarships annually, called the Robert G. Buzzard awards. From his eleven years as the head of the Geography Department at Illinois State (Normal) School, he sent twenty students to Clark Graduate School of Geography for Master's Degrees, and seven of these went on for the PhD.

CALDWELL, HARRY H. (BA 41, PhD 51), Professor of Geography, University of Idaho. He writes, "While a guest at the 23rd National Security Forum at Air War College, I made contact with fellow guest Clark Geography graduate Robert B. Atwood (AB 29), Editor and Publisher of the Anchorage Times and nephew of the late Clark President and Geographer, W. W. Atwood. I continue as Principal Investigator of a Post Audit Environmental Impact Assessment of the Boise Project funded by the Office of Water Research and Technology. I served as a visiting Professor at Boise State University. Off to Peru, Bolivia, and Chile this summer."

CHAMBERLIN, THOMAS W. (MA 37, PhD 46), is Professor of Geography, University of Minnesota, Duluth.

CHEW, MARGARET S. (PhD 60), Professor of Geography, University of Wisconsin, La Crosse, spent the summer of 1975 in Asia (Turkey, Kuwait, Iran, USSR, Mongolia and Afganistan). In July 1976 she is directing a geographical field trip to Czechoslovakia, East Germany, Poland and Hungary.

CHURCH, PHIL E. (MA 32, PhD 37), is retired, Professor Emeritus, Atmospheric Sciences, University of Washington, Seattle. His last two publications (since retirement four years ago) are "Radiation Climate of Barrow Alaska, 1962-66," with Gary Maykut, Journal of Applied Meteorology, June 73; and "Some Precipitation Characteristics of Seattle," Weatherwise,

December, 1974. He writes, "I come to my office at the University three times a week, continue our flower and vegetable gardening, build replicas of some museum furniture in my new workshop, help (as a part-owner) make the finest commercial wine at our small winery. Travel but little -- why leave God's country?"

CRANE, EDITH H. (MA 27), is retired, and writes, "In 1970, on retiring, we moved from Wellesley Hills, Mass. to Stuart Fla., where we bought a condominium. Stuart is a beautiful spot, where the St. Lucie and Indian Rivers empty into the Atlantic Ocean."

CREVELING, HAROLD F. (PhD 51), is retired. He writes, "Last fall Mildred, my wife, and I traveled to Europe. We visited France, Luxumburg and Switzerland. I teach a geography class to the Senior Citizens in Norman. Although the class members are old they are very enthusiastic and we have a very good time. I study painting. Mildred and I enjoy the many plays at the Oklahoma University theatre."

COX, CATHERINE ELIZABETH (AM 42), retired as Emeritus Professor from Fitchburg State College this year. A recent publication was a slide-tape on "Contrasts in South American Cities." She will attend the International Geographical Congress in Moscow this summer, visiting Central and Eastern Europe prior to the Congress, participating in two Congress excursions (Dynamics of Shoreline Erosion, Sochi-Tbilisi; Central Asia, Tashkent Area), and visiting Lenengrad and Copenhagen before returning.

CUMMINGS, HARRY (MA 73, PhD 75), is Regional Planner, Associate Director, Sulawesi Regional Development Study, Ujung Pendang, South Sulawesi, Indonesia. As of March 15, he left the Canadian Council on Rural Development to the University of British Columbia to work in Ujung Pandang to prepare a regional development plan for the four provinces of Sulawesi (Geographers may know it as the Celebes). He notes, "The work is giving me a chance to apply my dissertation research on migration and regional development in Indonesia to a specific region. I arrived in Indonesia in April and my wife, Marion Lefkowitz Cummings (Clark BA 73) will follow in early July after completing her second year of teaching in a French immersion program in Ottawa. Regards to all my friends, faculty and classmates. If you decide to take that jaunt to the far east this year, come and see us in Sulawesi." The project is financed by the Canadian International Development Agency.

CUNNINGHAM, FLOYD F. (AM 28, PhD 30), is retired as Professor Emeritus, Southern Illinois University. He is busy with geneological as well as geographical research. He was presented a plaque by the Earth Science and Planning Department, S.I.U.,

Edwardsville, Ill. "For Meritorious Service to the Illinois Geographical Society." He was also presented a Certificate of Appreciation Plaque by the Kiwanis Club of Carbondale "For Outstanding and Dedicated Service to Kiwanis, 1930-1973" at the end of a period of forty years of perfect attendance. In addition, Kiwanis International honored him on January 20, 1976 with the 85th Life Membership Certificate, the highest award given by that organization.

DAY, RICHARD L. (AB 48, AM 50), is Senior Analyst in Marketing Information with AMTRAK, the National Railroad Passenger Corporation, on leave from his position as Associate Professor of Geography at the University of Idaho. He writes, "The work consists of an extension of the passenger surveys I have been conducting on trains across the country during the past 4 1/2 years, dealing with passenger attitudes, travel habits, demographics, etc. Earlier research during my years at Idaho (funded projects) have included work for AMTRAK, a Microclimatic Profile from the top of the Clearwater Mountains to the bottom of the Snake River Canyon through the forests and wheat fields in between, and a study of the Idaho phosphate mining and manufacturing industry.

DEAN, VEVA KATHERN (MA 40, PhD 49), is retired. She writes, "Always something to do in and around our 1690 Cape Cod farm house. I am busy as a member of the Board of Directors of two island organizations dedicated to control and preservation of the natural landscapes of Martha's Vineyard. Research and writing on a special area in the Middle East continues."

DORNBACH, JOHN E. (PhD 67), Assistant Chief, Earth Observation Division, Science and Applications Directorate, Johnson Space Center, NASA, Houston, Texas. He writes, "If any Clark alums visit JSC, please give me a call on 483-4776 at the center and I'd be happy to show them our remote sensing activities. The Large Area Corp Inventory Experiment (LACIE) using Landsat data is our current major project." (Home phone 713 334-3459)

EICHEN, MARC (AB 71, PhD 76). Marc writes, "Before beginning my career I have involuntarily retired, temporarily, I hope, to Vermont. My current work includes looking for jobs, and writing grant proposals. Just in case I don't get a job, I'm working on my memoirs. Linda Ross and David McCauley send their best regards."

ELLEFSEN, RICHARD (MA 58) is Professor and Chairman, Department of Geography, San Jose State University. His primary research has been in land-use mapping, using computers with satellite digital data. This summer he traveled with his family to Helsinki to present a paper to the International Society of Photogrammetry Congress.

ELLIOT, FRANCIS (PhD 52), is retired.

ELWELL, HELEN BALK (MA 43, PhD 44), is retired after 31 years at Stephens College, Columbia, Mo., as Professor of Geography and Anthropology.

FAIRCHILD, WILMA BELDEN (MA 37), is a freelance geographical editor.

FUCHS, ROLAND J. (MA 57, PhD 59), is Professor and Chairman, Department of Geography, University of Hawaii at Manoa. He will be chairman of the U.S. NAS/NRC delegation to the 23rd International Geographical Conference in Moscow this summer. He will spend additional time this summer in Eastern Europe conducting a study of population distribution and redistribution policies in the socialist countries.

GANJI, MOHAMMAD (PhD 54), is Professor Emeritus, Tehran University, and Chancellor, Amir Showkatul -- Mulk University, Birjand, Iran. After 37 years of academic service as lecturer, professor, head of the Department of Geography, Dean of the Faculty of Arts and Humanities, Vice-Chancellor, all of Tehran University, he retired from active service in January 1976. He participated in a number of scientific conferences and seminars sponsored by the World Meteorological Organization and UNESCO, organized the Association of Iranian Geographers, of which he has been the president over the past four years.

GASSAWAY, ALEXANDER R. (PhD 71), is Professor of Geography, Portland State University. He has published with Harold Osterud and Julia James, Physician Manpower in Oregon: Regional and County Profiles, Portland, Ore.: Oregon Medical Assoc. 1976, 153 pp. (Incl. 12 maps. He will send free copies of maps to anyone wishing them.) A paper, "A More Meaningful Expression of Population-Per-Physician Ratios, the Case of Oregon, USA" will be presented in the Medical Geography Symposium, IGU, Moscow, July 1976. He has also published with Harold Osterud, et.al., Physican Manpower in Oregon Data Book, 1975, Portland: CHPA for the Portland Metrop. Area, 1975, 86 pp.

GIRGIS, MONIR SA'AD (PhD 57), is Professor of Geography, Edinboro State College, Edinboro, Pa.

GLASGOW, JOHN (AM 59, PhD 72), is Associate Professor, SUNY, New Paltz.

GOULD, LOREN (AB 53, AM 59), is Director of Institutional Research, Worcester State College. He delivered a paper on "The Value of Annual Faculty Profiles in Modern College Management" at the fall meeting of the Northeast Association for Institutional Research at New Haven, Conn. in November 1975 (to be published shortly in Proceedings volume). Travel was limited

to one trip to Denver in August to attend the Annual Forum of NCHEMS at WICHE. He also attended the First World Fantasy Convention in Providence the weekend of October 30th. "Spend my spare time working on the nine acres I bought in Hardwick where I hope to build a solar energy house."

HAFSTAD, KATHERINE B. (MA 30), is retired, Chairman of the Board, Harbor Springs State Bank and Chairman of the Board of Trustees, Central Michigan University. This summer she will be going as a delegate to two conventions -- the Biennial Convention of Zouta International in Wiesbaden, Germany, and the Republican National Convention in Kansas City.

HANKINS, TOM (PhD 74), is Associate Professor of Environmental Studies, West Virginia College of Graduate Studies. He writes, "The new environmental studies Master's program we began at the College last year attracted many students. It looks like we were right in our estimate of the need for it. Aside from school, being environmental managers of our own little farm on 18-Mile Creek back of the Kanawha River keeps the Hankins group very busy. Visitors welcome."

HARRIS, ALAN (51-52), is Reader in Geography, The University, Hall England. He notes that he is continuing work on aspects of the historical geography of Northern England.

HASTINGS, ANDREW D., JR. ( ), is Project Engineer, Topographic Products Development, U.S. Army Engineer Topographic Laboratories, Fort Belvoir, Va. For nearly three years he has been involved with the direct development of special thematic applications mapping for military operations. He researches military geographic intelligence data, formulates performance relationships at the soldier-environment or equipment-environment interface, compiles their distributions, and finally designs and tests graphic products for the field army. His most recent publications include two large experimental lithographs, "Tactical Armor Operations Graphics-Killeen, TX," 1974 and "Mountain Operations Graphics-Holy Cross, CO," 1975. He writes, "Spent a fortnight last year exploring the WW-I Austro-Italian cliff fortifications along the Dolomite Road on skis. What ever happened to my old CUGS friend, Warren Burton, who was at Clark in the early fifties?"

HAWLEY, DORTHEA BURTON (MA 47, PhD 49), is retired, moved to Fort Myers, Florida in May 1976.

HECOCK, RICHARD D. (PhD 66), is Professor and Acting Chairman, Department of Geography, Oklahoma State University. He was on sabbatical 1975-76; worked with the Northcentral Experiment Station in St. Paul, did research, and traveled in Mexico.

HESSER, WILLARD C. (MA 50), is a High School Instructor in Political Systems and Geography. He writes, "Three years to go for retirement. Travel the U.S. two months every summer, and have seen just about every geographical phenomena in the U.S. It's nice to see all the places, geology and geography I once studied. Pat enjoys it and my son Mitch is now a Sophomore in High School getting his history and geography spurs."

HOLZHAUER, EDITH HOYT (MA 28), and CARL F. (MA 28). Carl is now retired. They write, "We are fortunate to be able to spend the winter months in Pompano Beach, Florida."

HONES, GERRY (MA 53), is Senior Lecturer, University of Bath.

JAMES, PRESTON E. (PhD 23), is Maxwell Professor Emeritus, Syracuse University. Professor James is now writing on the history of geographical ideas, especially the history of professional geography in the United States. A paper summarizing the history of the AAG was published in the Newsletter of the American Council of Learned Societies, Spring-Summer, 1975. In the Professional Geographer, February 1976, he published a paper on the Process of Competitive Discussion. In July 1976 he attended the meeting of the Commission on the History of Geographical Thought of the International Geographical Union in Leningrad. For this he prepared a paper on the Development of Professional Geography in the United States, 1885-1940. At the Congress in Moscow he presided over the first session on Historical Geography. He has completed a paper with Cotton Mather on the "Periodic Field Conferences" 1923-1940 and Post-War, which will be published in the Annals. He is working on a history of the AAG which he hopes to have ready for publication at the 75th annual meeting in Philadelphia in 1979.

JENSEN, J. GRANVILLE (PhD 46), is Professor of Geography, Oregon State University.

JEYASINGHAM, WILLINA L. (MA 51, PhD 58), is Associate Professor and Head of the Department, University of Sri Lanka, Jaffna Campus. He was invited to spend three months (October 75 to January 76) at the South Asia Institute of the University of Heidelberg by the German Academic Exchange Service. He also visited places between Heidelberg and Cologne and got aquainted with Geographical Teaching and Research of West German Universities. Besides lecturing to undergraduates at the Jaffna Campus, he is engaged int he production of a geographical monograph on North Sri Lanka and research on transportation and development.

KANE, WILLIAM F., JR. (AB 51, AM 54), is Director of National and International Development, State of Arizona. He visited Clark this spring and attended the 25th reunion of his undergraduate class. In February, he hosted a delegation from the Arab countries to Arizona, and will spend five weeks in Egypt, Sudan, and Saudi Arabia at the invitations of these three governments in October-November. He hosted the President of Sudan on his visit to Arizona in June 1976. In September, he will conduct a seminar on "Business between Israel and Arizona" to be followed by a trade mission to Israel and Iran next February. He also gives a short overview course on the U.S. to Japanese middle management execs at the American Graduate School for International Management, and teaches at the University of Arizona Annual Basic Industrial Development Course every January.

KASPERSON, ROGER (BA 59) is Professor of Government and Geography, Clark University. Back from his sabbatical in Greece, he is continuing his research on nuclear energy safety in Project RARE; has, with other Clark people, a book -- Water Re-Use and the Cities -- in press at University Press of New England; and has recently been appointed to the Editorial Board of a new journal, Resource Recovery and Conservation.

KIRCHER, HARRY B. (PhD 61), is Professor at Southern Illinois. The fourth edition of his senior high school- Junior college text, Our Natural Resources should be out in June, with McNall co-author. Some 10,000 copies of the third edition were sold. He notes, "The Kirchers visited Hawaii at Chirstmas time and recommend it to all!"

KISTLER, ESTHER L. (MA 38), is a retired School Teacher. She writes, "The first week-end in May, I attended my 60th class reunion as a graduate of Kutztown State College, which was the Keystone State Normal School when I graduated from it. The first weekend in June, I plan to attend my 50th class reunion as a graduate of Pennsylvania State College, now the Pennsylvania University."

KOELSCH, WILLIAM A. (MA 59) is Associate Professor of Geography and History, University Archivist, Clark University. He writes, "My essay, 'Terrae Incognitae and Arcana Siwash: Toward a Richer History of Academic Geography,' appeared in Geographies of the Mind in January. I have also recently completed an esay on Wallace W. Atwood for the IGU Commission on the History of Geographic Thought bio-bibliography series and will shortly finish one on N.S. Shaler. With these and a book review out of the way, I shall return this summer to my research on the history of Clark and to some new research on the historical geography of Boston's residential neighborhoods." He continues as a member of the Massachusetts

Archives Advisory Commission; this year he became a Corresponding Member of the IGU Commission on the History of Geographic Thought, and a member of the Committee on College and University Archives of the Society of American Archivists. He was listed this year in Who's Who in the East and will shortly be listed in the Dictionary of International Biography.

LEACH, JONATHAN A. (MA 69), is a Pilot with the U.S. Air Force. He took another two trips to Europe for two months each in England and Germany, courtesy of the Air Force. Many sights were seen and overflown. He also married Vivian J. Kinder, another geographer, BA University of Central Arkansas.

LENTZ, PEGGY A. (PhD 74), is Assistant Professor of Urban and Regional Planning, University of New Orleans. For 1976, she was awarded a grant from the Commission of the European Communities to do a study on "The Status of Women, the Level of Urbanization and Attitudes toward European Integration."

LEWIS, TOM (NDEA Institute 66-67), is Associate Professor of Geography, Manchester Community College, Manchester, Connecticut. He is the new editor of the NESTLVGS Newsletter, and gave a paper at the New Haven NESTBGS meeting in Fall 1975. His book, Silk Along Steel, was published in June, and he will have an article in the Fall issue of the Connecticut Historical Society Bulletin. He received a grant from the Connecticut Humanities Council to help them set up a series of seminars on directing and controlling community growth.

LIARD, THEODORE J. (MA 48), is Chief, Geographic Names Division, Defense Mapping Agency Topographic Center, Washington, D.C.

LEMAIRE, MINNIE E. (MA 32, PhD 35), is retired, Professor Emeritus of Geography, Mt. Holyoke College. She took a 44 day trip on the M.S. Renaissance circumnavigating South America. She comments, "The Straits of Magellan did not live up to reputation, for we had little wind, calm seas and at Pureta Arenas, the warmest day of the summer with plenty of sun. We were in Rio for a bit of Mardi Gras. One special observation -- many Russian and East European vessels at ports on the east side of South America, and very few from the U.S."

LOGAN, RICHARD F. (BA 36, MA 37), Professor of Geography, U.C.L.A., is Chairman of a Commission of the South West African Legislature, developing long-range development SNF conservation plans for a large desert and semi-desert area. He is also a consultant to the Southern California Edison Co. in the development of an environmental sensitivity index for desert, mountain and coastal areas. With Kendall, Glendinning and MacFadden, he has co-authored Introduction to Geography and

Introduction to Physical Geography, college textbooks published by Harcourt Brace Javenovich. He is participating in a Study Mission to Israel under the auspices of the American Professors for Peace in the Middle East.

LOUGEE, CLARA ROM (PhD 56), is retired, and busy researching and writing. She notes, "I have just had published the volume Late-Glacial Chronology (by Richard Lougee and Clara Rom Lougee), Vantage Press, New York, 1976, which is the work I promised Professor Lougee I would do for him. I am currently working on the geological history of a completely neglected section of the United States, which will require a year or two to finish. Travel time in the past year includes several weeks in Norway, a fortnight in Canada, a long weekend in Bermuda. Plans for 1976 are not fully organized, but we'll probably hit the roads to New England and eastern Canada in late summer."

LYONS, SISTER MARION (PhD 63), is semi-retired. She just returned from a vacation in the U.S. Virgin Islands. She writes, "Am enjoying my retirement."

McINTYRE, WALLACE E. (MA 47, PhD 51), is employed by the U.S. Government. He has traveled with Mrs. McIntyre in Romania and in Greece. Mrs. McIntyre spent 17 days in the USSR in November 1975, including a week in Novosibirsk. His son, William, who once sat on the top of the Alps in the old Clark workroom, is now an M.D. practicing on the eastern shore of Virginia.

MAIER, EMANUEL (PhD 61), is Chairman, Department of Earth Sciences and Geography, Bridgewater State College. His son Barney graduates in June 1976 from U.C.L.A. as an architect; his daughter Rachel graduates from Brandeis, also June 1976.

MASO, MARIA B. (MA 55), is a Teacher with the Chicago Board of Education.

MELEEN, NATE (AM 64), is Assistant Professor of Earth Science and Geography, Oral Roberts University. He has finished his doctoral dissertation except for the defense, which is expected to be in September. Subject: Strip mines and fluvial systems.

MENSOIAN, MICHAEL G. (BA 49), is Professor of Geography and Chairman, Department of Regional Studies, Boston State College. He is completing research on the migrational behavior of Spanish-speaking residents of Boston.

MERRIAM, FREDERICK S. (AB 39, MA 46), is a Sales Representative for Waddelland Reed, Inc.

MILLER, D. DAVID (MA 72), is Schoolmaster at Taunton School, Taunton, England. He writes, "Recent acquisition of a very fast motorcar, an MGB, has enabled much travel at home and abroad, usually the more mountainous parts of England and in the Netherlands, Belgium, West Germany and France. However, the inevitable demise of the pound should put a stop to this."

MILLS, FRANK L. (PhD 74), holds a joing appointment as Institutional Research Officer and Assistant Professor in the Social Sciences College of the Virgin Islands. He presented a paper at the Tenth West Indies Economics Conference, Georgetown, Guyana: "Planning for Greater Agricultural Production Within Rainfall Limits." Forthcoming in June is "Production Relationships among Small-Scale Farmers in St. Kitts," Social and Economic Studies. He is currently providing technical assistance in survey techniques to the Virgin Island Planning Board's federally funded program in a three-island Coastal Zone Management Survey.

MINOGU, JAMES A. (MA 36), has been retired from the Federal Government (Department of Defense) since 1970. He writes, "Active, with my wife, Adelaide, in horticultural pursuits, mainly on the Blue Ridge, where we built a new home into which we are now moving. In addition to plant propagation, garden maintenance, lecturing on indoor light gardening and rock gardening, have found time to serve as chairman of the Potomac Valley Chapters of the Indoor Light Gardening Society of America and the American Rock Gradening Society. I currently serve on the national boards of both societies. We have also acted as volunteer guides at the National Arboretum, and will attend the International Rock Garden Plant Conference in Seattle and Vancouver in July, participating in various sports in the Olympics and Northern Cascades. We enjoy and put to use much of what Dr. Ekblaw's courses in plant ecology and geography attempted to inculcate."

MOULTON, JOHN M. ( ), is retired, Professor Emeritus, Hastings College. He will be retired from teaching Geography and Geology at the close of summer school 1976. He is now working on the Hastings College Centennial Campaign as a fund raiser and has traveled over most of the western states except Alaska and Hawaii. He will continue in this work for another year.

MUNCASTER, RUSSELL W. (MA 68, PhD 72), is Associate Professor and Chairman, Geography Department, Wilfred Laurier University, Waterloo, Ontario.

MURPHY, RICHARD E. (PhD 57) is Professor and Chariman, Department of Geography, University of New Mexico. He writes, "I have just returned from a year as a Fulbright lecturer at the

University of the Saaeland in Saarbruecken, West Germany. There I introduced a course in Political Geography, a subject that has been largely neglected in Germany since the debacle of World War II.

NASON, NATALIE E. (MA 48), is an Education Services Officer, U.S. Air Force, Minot Air Force Base, North Dakota.

PARSON, RUBEN L. (MA 34, PhD 43), is Geography Professor Emeritus, Saint Cloud State University. He has almost completed a chronology of his grandfather from Skane, Sweden to his Minnesota Homestead in 1869, length about 300 pages, including 56 graphics.

PICO, RAFAEL (MA 34, PhD 38, LLD [Hon.] 62), is Vice-Chairman of the Board, Banco Popular de Puerto Rico, San Juan. He participated in meetings of the Advisory Committee of the Spatial Analysis of Land Use Project at the universities of Arizona (Tempe) and Florida State (Tallahassee). Next meeting will be held at Michigan State in late October.

PRESTON, RICHARD E. (PhD 64), is Professor of Geography, University of Waterloo, Ontario. A recent publication is "A Comparison of Five Measures of Central Place Importance and of Settlement Size," Tijdschrift voor Economises en Sociale Geografie, 66 (1975), pp. 178-187.

PRIDDLE, G.B. (MA 64, PhD 74), is Associate Professor and Chairman, Man/Environment Department, University of Waterloo and Chairman, Provincial Parks Commission Advisory Council. He was recently appointed Department Chairman. He has received research grants to study the impact of utility corridors, to do a scenic road inventory of Waterloo County, and to study shoreline management. He has also gone into the marina and boat sale business. He sailed French Polynesia in May 1976.

PRINCE, HUGH (visiting Professor 71), Reader in Geography, University College, London, is currently collecting material for the study of the historical geography of England from 1750 to 1850.

RADFORD, JOHN (PhD 74), Associate Professor, York University, Toronto, is one of three Clark PhD's at York (the others being George Tatham and Tait Davis).

REINWALD, LEWIS T. (MA 49), is a Computer Program-Systems Analyst for the U.S. Bureau of the Census. He is active in a task group on decision tables.

RETALLICK, HAROLD J. (MA 47, PhD 50), has returned as Professor at the University of Nebraska, Omaha, after a year in Europe at air bases in England, Italy, Spain and Germany.

RIORDAN, PAULINE (MA 59), is a Geographer with the U.S Army Engineer Topographic Laboratories, Ft. Belvair, Virgina.

ROBINSON, J. LEWIS (PhD 46), is Professor of Geography, University of British Columbia, Vancouver. In may 1976, he was awarded the top award to a Canadian geographer by the CAG, "Service to the Profession," for his 33 years of work in Canadian geography and his list of more than 120 published items in geography, presented at the annual CAG meeting in Quebec City. He notes, "Of less national significance but of real satisfaction to me, was another award as runner-up to the "Master Teacher" award at UBC, nominated by students and selected from all university faculty."

SCHNEIDER, LEONARD R. (MA 30), retired from teaching in 1964, has traveled to Scandanavia, Switzerland, the Carribean, Alaska, Hawaii, and most of the National Parks. He writes, "Last Spring the Director of the Polar Division of the National Archives at Washington requested photographs, newspaper clippings, memorabilia and several published articles on my stay of 13 months on Sondre Stromfjord, Greenland (1928-29). This expedition explored the possibility of making Greenland a stopping place for air flights from this country to Europe. The fliers Hassell and Cramer crashed on the inland icecap and subsequently were rescued by our party. The expedition was sponsored by Dr. Hobbs of the University of Michigan. Its chief purpose was to collect meteorological data on the west coast of Greenland."

SCOTT, HARLEY E. (AM 63), will receive an EdD from Indiana University, Bloomington, in August. He plans a book on his dissertation, on the degree of correlation between the distribution of public institutions of higher education and populations within the 48 adjacent states, with maps of institutional commuting areas. Probable title, "The Geography of Public Higher Education in the 48 Adjacent States." He is seeking an established, published geographer interested in public education as a partner in the book.

SHAW, EARL B. (PhD 33), is retired.

SHAWKEY, ADA M. ( ), retired from the chairmanship of the Geography Department, Framingham State College. She writes that she enjoys the freedom of not being scheduled, continues to study the USSR (leading a study group for AAU), and spent some time traveling in southeastern Canada.

SHIN, SUK-HAN (MA 68), is Assistant Professor, Eastern Washington State College. He chaired the Social Science Section at the 49th Annual Meeting of the Northwest Scientific Association. The theme of the section was "Environment and Resourceship." Since his department has a terminal computer

capable of drawing maps and graphs, he is building up a computer file for the department.

SIEVERS, ANGELIKA (MA 36), is Professor of Geography and Head of the Geography Department, University of Osnabrueck, Vechta Branch. She has been busy planning curriculum for reformed geography courses, and has published in this area. In winter 1976-77 she plans a three-month research stay in South Africa, where her interests are irrigation problems and programs and the tourist industry.

SIMPSON, ROBERT B. (MA 34, PhD 41), Professor of Geography, Dartmouth College. He writes, "Having finished my research program here a year ago, I am retiring also from teaching this June. Dottie and I will alternate between New Hampshire and Florida for the time being, after 11 years here at Dartmouth, 4 with private industry and 20 with the U.S. Army, since getting that PhD with the class of 1941 at Clark 35 years ago."

SMITH, DAVID A. (BA 66, MA 68), formed a new company, Lane, Noland, Smith and Co., in Febraury. They specialize in arranging financing for major real estate projects.

SORVO, PAUL J. (AB 53), is a Cartographer, Topographic Division, U.S. Geological Survey, Reston, Virginia. He is a member of the Staff of the Domestic Names Committee, U.S. Board on Geographic Names, the function of which is to standardize geographic name usage on Federal Government maps and publications. The staff has also compiled all geographic names in Massachusetts with coordinates, description variant names, history, etc., and placed this information on magnetic tape for research purposes.

SPARICIO, FRANK J. (MA 63), Secretary, Hartford Insurance Group, writes, "In developing an office park in the desert northwest of Phoenix, we have successfully (thus far, at least) maintained a balance with nature. Occasional jack rabbits, prairie dogs, coyotes and rattlers are seen in and around the partially completed project."

STACEY, KARL (PhD 55), is retired, an Energy Consultant. He has made trips to Greece, Spain and Italy in the last three years. "Our three boys are all in Graduate Schools... Georgetown and Kansas U." He adds, "I still believe the PHYSICAL ENVIRONMENT is crucial to the well-being or failure of every society and region."

STERNBERG, ROLF (MA 55), Assistant Professor, Montclair State College, presented a paper on Latin America, "Land Redistribution and the Future," at the AAG meeting in NYC. His next research will be on MNC's and Latin America. He will be in Brazil and Argentina for nearly three months this summer,

doing research on population, land distribution and MNC's. "If time allows Frances and I will cross over to visit friendly Chile."

STONE, ROBERT G. ( ), is retired. He has been examining the mountain areas of Pennsylvania very closely by food and car, no formal study yet.

TOBEY, RAY W. (AM 53), is retired. He writes, "Mrs. Tobey passed away July 20, 1975 after a long illness. I have been doing some research in local history and early surveys and speak occassionally to schools and local organizations."

UNDERHILL, HESTER CHISOLM (AM 38), is Social Studies Department Chairman, Littleton High School, Littleton, N.H. She writes, "My youngest son is working in Yellowstone Park this summer. Our oldest is married and living in Massachusetts, after six years in the U.S. Army. Last summer my husband and I spent a month in Manitoba, Ontario and midwestern U.S. This summer we will be spending a month in Newfoundland."

VAN THUYL, H.E., JR. ( ).

WEST, SEYMOUR (SI) (MA 41), is a retired federal employee. He writes that he is moderately active conducting book searches for out of print books, collecting, buying and selling rare books.

WHITEFORD, GARY (MA 68), is Assistant Professor, University of New Brunswick, Fredericton, where he has been teaching geography in the Faculty of Education since 1974. He presented a paper at the NCGE meetings in Toronto 1975 with a fellow Faculty of Forestry person. In December 1975 he took some 40 students to Southern California and Mexico for Christmas break and this year will go to the Canary Islands. This summer he will teach a geography course on Jamaica with Ben Richardson of Carroll College. He has high hopes for a paperback Maritime Atlas to be published in the late fall.

WILLS, BERNT LLOYD (42-3), is Professor of Geography, University of North Dakota, Grand Forks. He writes, "My books and other school supplies now dominate the North Dakota market. My two children have grown, married and presented me with three grandchildren. All are well. I have three more years to teach -- the state law says 'No more.' I am busy teaching and carrying on geographical research for state grants."

WOOD, DENIS (MA 69, PhD 73), is Professor of Design, School of Design, North Carolina State University. He writes,
"It is May. The magnolia is blooming.
Here and there its leaves turn brown
and fall. Underfoot these crackle
and shred
like the ten thousand words

I have written this past year.
Few of them are worth repreating.
Diligently we teach our son
how to use this language
and wish him the luck
to make more sense with it."

ZAINI, NADIRSYAH (MA 58), is Chariman, Chief, National Family Planning Coordinating Board (Badan Koordinasi Keluarga Berencana Nasional) Lampong Province, Indoensia. The BKKBN is a government agency for all projects and activities related to the population explosion problem in Indonesia. The Family Planning program is integrated with the Indonesian Five Year Development Plan, with the main goals to establish family welfare and prosperity. The BKKBN was established in 1974 under the governor of each province. On the national level, the agency has a long term goal of a population of 220 million for the year 2000, which would mean a reduction of 60 million births through family planning. He writes however, "But it is very contradictory that my family is quite large, because my wife and I have nine children, five sons and four daughters." He sends his best wishes and congratulations for our 200 years of independence.

IN MEMORIUM:

BISSELL, MALCOLM H. (PhD 28), August 21, 1975.

CARLSON, ALBERT (PhD 39), January 22, 1975.

The Graduate School of Geography

1975-76

Front row (left to right): Paul Kariya, Hilary Renwick, Kitty Sibold, David Seamon, Douglas Johnson, Avi Zahavi, Ruth Rowles, Ellen Head, Jim Lyons, Evelyn Larson, Gary Roboff, Michael Steinitz.

Middle row (left to right): Bret Halverson, Steve Feldman, Gerald Karaska, David Pijawka, Saul Cohen, Alan Sharaf, Harry Schwarz, Beverly Cofrancesco, John Bik, Carl Schwarzer, Steve Sawyer, Paul Oberg, Kirsten Haring, David Campbell, Bill Renwick, Johnette Ebbeling, Mary O'Malley, Duane Knos, Janice Jones, Martyn Bowden, Elsie Sullivan, Roger Kasperson, Courtice Rose.

Back row (left to right): Nurit Kliot, Garry Kessler, Esther Bowring, Forrest Cason, David Magid, Yaron Pruginin, Amram Pruginin, Bob Wirtshafter, Eliot Wessler, Vernon Domingo, Louise Burnard, Bill McCall, Graham Rowles.